



PORTLAND HARBOR RI/FS

**ROUND 3B FISH AND INVERTEBRATE TISSUE AND
COLLOCATED SURFACE SEDIMENT
FIELD SAMPLING REPORT**

DRAFT

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This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

February 15, 2008

Prepared for
The Lower Willamette Group

Prepared by
Integral Consulting Inc.
Windward Environmental LLC

IC08-0002



RECOMMENDED FOR INCLUSION IN ADMINISTRATIVE RECORD

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10

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Document ID #: _____ *1309207*

File #: _____ 2.7.1-5

Site Name: _____ Portland Harbor
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Round 3B Fish and Invertebrate Tissue
And Collected Surface Sediment
Field Sampling Report
Appendix B

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Eric Blischke
US Environmental Protection Agency,
805 SW Broadway, Suite 500
Portland, OR 97205

From: Maja Tritt
Integral Consulting, Inc.
7900 SE 28th Street, Suite 300
Mercer Island, WA 98040

Date: February 15, 2008

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LIST OF ACRONYMS

Axys	Axys Analytical Services, Ltd.
BLM	U.S. Bureau of Land Management
CAS	Columbia Analytical Services
COC	chain-of-custody
COI	contaminant of interest
CORS	continuously operating reference station
DGPS	differential global positioning system
DI	de-ionized
DQO	data quality objective
EDD	electronic data deliverable
EES	Ellis Ecological Services
EPA	U.S. Environmental Protection Agency
EQulS	Environmental Quality Information System
ESA	Endangered Species Act
FSP	field sampling plan
FSR	field sampling report
FWM	food web model
HARN	High Accuracy Reference Network
HP	horsepower
LWG	Lower Willamette Group
LWR	Lower Willamette River
ME	Marine Endeavors
MGS	Mullins Guide Services
MSS	Marine Sampling Systems
NAD83	North American Datum of 1983
NOAA	National Oceanic and Atmospheric Administration
OBPC	Oregon Bass Panfish Club
ODFW	Oregon Department of Fish and Wildlife
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
QAPP	quality assurance project plan
QA/QC	quality assurance/quality control
RI/FS	remedial investigation and feasibility study
RM	river mile
R/V	research vessel
SDG	sample delivery group

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SEA	Striplin Environmental Associates
SOP	standard operating procedure
SVOC	semivolatile organic compound
TOC	total organic carbon
WGS84	World Geodetic System 1984
USFS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

This field sampling report (FSR) summarizes the Round 3B fish and invertebrate tissue and collocated surface sediment field sampling activities that were conducted from August 7 through December 6, 2007. These Round 3B data supplement the Round 1, Round 2, and Round 3A fish and invertebrate tissue data, and represent the final tissue collection effort conducted as part of the remedial investigation and feasibility study (RI/FS) for the Portland Harbor Superfund Site (Site).

The U.S. Environmental Protection Agency (EPA) concluded that the data set from the previous sampling rounds was inadequate for the completion of the RI/FS and proposed the collection of additional composite samples of five fish and shellfish species previously collected for the Portland Harbor RI/FS (EPA 2007a). These species included sculpin, crayfish, carp, smallmouth bass, and Asian clams. EPA specified the target sample areas and numbers of samples of each species to be collected within river mile (RM) 2 to 11 of the Study Area and additional samples to be collected outside of the Study Area from RM 1 and 2 and RM 11 and 12.2 (EPA 2007b).

The fishing and sample processing methods used during the Round 3B field sampling effort followed the Round 3B Fish and Invertebrate Tissue and Collocated Surface Sediment Field Sampling Plan (referred to hereafter as the Round 3B Biota FSP) (Integral 2007b). The methods build upon previous experience collecting biota at the Site as described in the Round 1 FSP (SEA et al. 2002), the Round 1 Laboratory Quality Assurance Project Plan (QAPP; SEA 2002b), the Round 2 Benthic Invertebrate FSP (Windward and Integral 2005) and supplemental memorandum (Windward 2005), the Round 2 QAPP (Integral and Windward 2004) and QAPP Addenda 5 and 9 (Integral 2005, Integral 2007a), and the project health and safety plans (SEA 2002a; Integral 2004, 2007c; Windward 2007). All sampling and analysis methods detailed in this FSR were consistent with the methods used in previous FSPs and QAPPs for fish and invertebrate tissue and collocated sediment.

1.1 ROUND 3B SAMPLING OBJECTIVES

In its June 8, 2007 letter to the Lower Willamette Group (LWG), EPA requested that additional composite tissue samples from various species were needed to meet two primary data quality objectives (DQOs; EPA 2007a). Excerpts from these DQOs are listed below:

1. *Contaminant of Interest [COI] Uncertainty* – “for refining uncertainties in COI tissue concentrations in order to ensure that the full range of contaminant sources are captured in the tissue sampling” and “to ensure a representative data set both to identify sources and to characterize ranges in risk for both ecological receptors and humans”

2. *Food Web Model [FWM] Calibration and Validation* – “to confirm the utility, ability, and accuracy of the FWM to meet its objectives.”

To meet these sampling objectives, the following species were collected during Round 3B:

- Sculpin (*Cottus asper*, *C. perplexus*, and *Cottus* sp.)
- Crayfish (*Pacifasticus leniusculus*)
- Smallmouth bass (*Micropterus dolomieu*)
- Carp (*Cyprinus carpio carpio*)
- Asian clam (*Corbicula* sp.).

1.2 REPORT ORGANIZATION

The remaining sections of this document describe the field collection procedures used during Round 3B for fish and invertebrate tissue and collocated surface sediment samples. Section 2 provides a chronology of the sampling activities. Section 3 describes the field sampling methods, tissue processing procedures, quality assurance/quality control (QA/QC) procedures, and deviations from the Round 3B Biota FSP. Section 4 discusses chemical analyses that will be performed for the characterization of fish and invertebrate tissue and collocated surface sediment samples. Reporting requirements are described in Section 5, with cited references listed in Section 6. Supporting information is provided in seven appendices:

Appendix A: EPA-LWG Communications

Appendix B: Field Notebooks and Sample Identification Changes

Appendix C: Fish Tissue Field and Field Lab Processing Logs

Appendix D: Collocated Surface Sediment Sample Logs

Appendix E: Clam Processing Logs

Appendix F: Fish and Invertebrate Tissue and Collocated Sediment Master Table

Appendix G: Fishing Permits.

2.0 CHRONOLOGY OF FIELD OPERATIONS

A reconnaissance survey was conducted by EPA and LWG on August 7, 2007, to verify target sample locations and identify appropriate habitat for target species. Approval to proceed with the sampling was provided by EPA in a letter dated August 17, 2007 (EPA 2007c; Appendix A). Sampling locations shown in Figure 2-1a-d reflect the proposed sampling locations resulting from the field reconnaissance survey.

The Round 3B fish and invertebrate tissue and collocated surface sediment sampling event commenced on August 27, 2007 and was completed by December 6, 2007. The sampling dates for the various sample collection efforts are listed in Table 2-1 and summarized below.

- **August 27 - September 28, 2007** - Collection of all target fish and crayfish species.
- **October 4 – October 5, 2007** - Acquisition of GPS coordinates for actual sculpin and crayfish sampling stations.
- **October 15 - October 18, 2007** - Collection of collocated sediment samples at sculpin and crayfish stations.
- **November 12 - November 16, 2007** - Collection of clam tissue.
- **November 19 - November 22, 2007** - Collection of collocated sediment samples at clam stations, with an additional day of sampling on December 6, 2007.

Members of the regulatory agencies and trustees were present at various times to observe and oversee all aspects of field and field lab operations for fish, invertebrate, and collocated sediment collection and sample processing.

3.0 FISH AND INVERTEBRATE TISSUE AND COLLOCATED SEDIMENT SAMPLING

Collection of fish and invertebrate tissue and collocated sediment from the Site followed guidelines provided in the Round 3B Biota FSP (Integral 2007b). EPA specified the target sample areas and numbers of samples of each species to be collected within RM 2 to 11 of the Study Area and additional samples to be collected outside of the Study Area from RM 1 and 2 and RM 11 and 12.2 (EPA 2007b).

Three fish, one crayfish, and one clam species were collected for tissue analyses. In addition, collocated surface sediment was collected at crayfish, sculpin, and clam stations. Four sampling techniques were used during Round 3B to collect fish: backpack electrofishing, set lines (i.e., trot lines), angling, and crayfish traps. Clams were collected using a benthic sledge.

A total of 414 fish, 816 invertebrates, and 20 collocated sediment samples were collected over 32 field sampling days. Table F-1 in Appendix F provides the records for each fish and invertebrate caught during the Round 3B sampling effort. The species collection effort included the following:

- 230 sculpin (Figure 3-1a-r, Table 3-1)
- 80 crayfish (Figure 3-1a-r, Table 3-2)
- 136 smallmouth bass (Figure 3-2a-d, Table 3-3)
- 48 carp (Figure 3-3a-c, Table 3-4)
- 736 clams (Figure 3-4a-j, Table 3-5).

Twenty collocated sediment composites were collected at sculpin, crayfish, and clam sampling locations (Table 3-6, Figures 3-1a-r and 3-4a-j).

Fishing and tissue collection efforts required a substantial amount of resources and personnel. Integral staff coordinated the overall effort, which was carried out primarily by personnel from Ellis Ecological Services (EES, Estacada, OR) as the fishing permit holder. EES was assisted by Windward Environmental LLC (Windward, Seattle, WA), SWCA Environmental Consultants (SWCA, Portland, OR), Kennedy/Jenks Consultants (Kennedy/Jenks, Portland, OR), Marine Endeavors LLC (ME, Ridgefield, OR), Marine Sampling Systems (MSS, Burley, WA), Mullins Guide Services (MGS, Lynnwood, WA), Benthic LLC (Benthic, Portland OR), and the Oregon Bass Panfish Club (OBPC, Portland, OR). Table 3-7a-b lists the names of the 46 individuals who participated in the biota tissue collection effort.

All people directly involved with the fishing effort were authorized to collect fish under the National Oceanic and Atmospheric Administration (NOAA) Fisheries 4(d) scientific

taking permit (OR2007-4082 partial and OR2007-4082M1 partial) and Section 10 scientific taking permit granted to EES by the Oregon Department of Fish and Wildlife (ODFW) (Appendix G). A summary report was also submitted to NOAA Fisheries and is included in Appendix G.

The following sections summarize the procedures and methods used to collect Round 3B fish and invertebrate tissue and collocated surface sediment samples, including station navigation and positioning, sampling procedures, recordkeeping, sample handling, sample storage, and field QC procedures. Sampling procedures generally followed those detailed in the Round 3B Biota FSP (Integral 2007b), the Round 2 QAPP (Integral and Windward 2004), and QAPP Addendum 9 (Integral 2007a). Deviations from the FSP are discussed in Section 3.10.

3.1 SAMPLING VESSELS

A total of six subcontractors, and a volunteer team from the OBPC, were equipped with specific sampling gear on their boats to collect fish and invertebrate tissue and collocated sediment samples. These subcontractors and their respective sampling equipment are described below.

EES provided an 18-ft boat with a 30-horse power (HP) outboard engine and a 14-ft skiff with a 10-HP outboard engine. These boats were used for backpack electrofishing, retrieving set lines, angling, and deploying and retrieving crayfish traps.

SWCA provided a 20-ft boat with a 125-HP outboard engine. This boat was used as a second boat for backpack electrofishing, angling, the deployment and retrieval of set lines and crayfish traps, and the deployment of a single 0.1-m² van Veen sediment grab at difficult sampling stations.

ME provided the research vessel (R/V) *Local Motion* for the collection of collocated sediment samples at sculpin and crayfish stations. The *Local Motion* is a 29.5-ft-long fiberglass bowpicker equipped with a Volvo 305-HP engine with two Volvo 290 duo-prop outdrives.

MGS provided a 25-ft Woolridge Jet Sled with a hard top and a 454-HP engine. The boat was equipped with a stern-mounted davit and hydraulic winch (~500 to 1,000 lbs) that was used for the collection of clams with a benthic sledge and the collection of collocated surface sediment samples at clam stations with a single 0.1-m² van Veen grab.

Benthic provided the 28-ft pontoon boat R/V *Ross Island Sampler I*, with an 8-ft-long by 4-ft-wide deck equipped with a moon-hole, which was used to sieve the clams from the mud collected by the benthic sledge and further process the clam samples. The covered aft deck space included a dry work area for maintaining and filling out paperwork (e.g., field forms).

MSS provided the R/V *Peter R*, a flat-deck, 26-ft-long catamaran with twin 120-HP engines for sampling collocated sediment at two clam stations (GCA11E and GCA12E). The vessel was equipped with a hydraulically operated A-frame with a boom, a 1,000-lb-capacity hydraulic winch, and a computer-integrated differential global positioning system (DGPS).

Members of the OBPC provided two boats that were used for angling of smallmouth bass and carp. The two 18-ft-long fiberglass bass boats were equipped with 150-HP outboard engines and electric trolling motors mounted on the bow.

3.2 NAVIGATION AND STATION POSITIONING

Station positioning for all sampling vessels was accomplished using a DGPS. The standard projection method used during field activities was the Horizontal Datum: North American Datum of 1983 (NAD83), State Plane Coordinate System, Oregon North Zone. Positioning accuracies on the order of ± 3 meters were achieved. The different combinations of GPS hardware and software utilized are described below.

3.2.1 Trimble Pro XRS Backpack DGPS Unit with TSC1 – Fish and Crayfish Sampling

For smallmouth bass and carp sampling, the Trimble Pro XRS backpack unit equipped with an integrated L1 GPS/beacon/satellite differential antenna and a TSC1 handheld unit was used to record the coordinates manually onto field sample forms. Real-time differential corrections occurred by transmission of the Coast Guard Radio Beacon without a post-processing correction. Recorded coordinates were compiled in a database, and locations were plotted in horizontal datum of the World Geodetic System 1984 (WGS84). The GPS positioning accuracies for actual samples were on the order of ± 3 meters. The GPS coordinate database was plotted as an event theme in ESRI's ArcGIS and converted to an ESRI shapefile format.

The sculpin and crayfish fishing areas were marked with two Xs on the shoreline with orange spray paint, 100 ft apart from each other, and the actual GPS positions for each sampling station were recorded once all sampling was completed. The positional data from these units were recorded directly into the field logs during sample acquisition. Both target and actual geodetic coordinates for all stations sampled, including field replicates, are provided in Table F-1 (Appendix F).

Data was digitally recorded in the TSC1 unit. Pathfinder 3.0 was used for post-processing data corrections of collected GPS positions. The base station used for the post-processing correction was the U.S. Fish and Wildlife Service/Bureau of Land Management (USFS/BLM), Portland, OR, which references the horizontal datum of WGS84. After post-processing data corrections, the accuracy of actual GPS positions was on the order of ± 1 meter. The post-processed corrected data file (.cor file) was exported from Pathfinder 3.0 to an ESRI shapefile format.

The exported shapefiles for all fish and crayfish referenced the horizontal datum of WGS84. A horizontal datum conversion was applied in ESRI's ArcGIS from WGS84 to the North American High Accuracy Reference Network (HARN) 1983, State Plane Coordinate System, Oregon North Zone, international feet. Station coordinate locations in the HARN datum were calculated and this file was used in project maps.

3.2.2 Trimble Pro-XRS DGPS Unit Connected to a Laptop Using TerraSync Pro – Clam and Collocated Sediment

The navigation system used for clam tissue and collocated sediment sample collection consisted of a Trimble Pro XRS receiver unit equipped with an integrated L1 GPS/beacon/satellite differential antenna unit on the sampling vessel. The antenna unit received real-time differential corrections from the continuously operating reference station (CORS) at Appleton, WA. The Trimble DGPS antenna was secured on top of the davit to achieve the most accurate position for each sample. Positional accuracies on the order of ± 3 meters were achieved with this system. The Trimble DGPS receiver output was displayed and recorded in real-time to an integrated navigation software package (Trimble TerraSync v. 2.50) on a laptop computer.

Pathfinder 3.0 was used for post-processing data corrections of collected GPS positions. The base station used for the post-processing correction was USFS/BLM, Portland, OR, which references the horizontal datum of WGS84. After post-processing data corrections, the accuracy of actual GPS coordinates was on the order of ± 1 meter. The post-processed corrected data file (.cor file) was exported from Pathfinder 3.0 to an ESRI shapefile format.

The integrated navigation system displayed the vessel's position relative to the target sampling location in plan view on the laptop screen. The screen display and numeric navigation data, including range and bearing to the target sampling location, assisted the vessel operator in approaching a station position.

For each benthic sledge sampling attempt, GPS data logging was initiated once the sledge touched river bottom. Tow cable was extended to a length of approximately four times the water depth. Water depth and cable length were recorded in the logbook. Once the cable winch was locked, the time for starting the tow was noted and a segment break on the recorded tow line was inserted in TerraSync. Subsequently, the navigation system continued to record the boat's positions of the actual tow for the duration of one minute. The actual tow location and orientation was corrected by placing the actual tow length (the origin of the second tow line segment) at the point where the benthic sledge touched river bottom, and the tow direction was adjusted to match the tow angle of the final tow segment.

Sampling at each station was initiated by performing a tow with the benthic sledge at the target coordinates presented in the FSP. If no clams were found in the initial tow, the search area was expanded until clams were found. The remaining tows were then

performed in close vicinity of the successful tow. Section 3.3.4 below provides additional details on clam sampling methods.

3.2.3 Trimble AG132 DGPS Unit Connected to a Laptop Using Nobeltec - Collocated Sediment Sampling for Crayfish and Sculpin

For the power-grab surface sediment sampling, MSS provided navigation and station positioning aboard the R/V *Peter R* using a DGPS and integrated Nobeltec navigation software. Positional accuracies of ± 3 meters were achieved with this navigation system. The DGPS receiver was situated on top of the A-frame over the sampling gear to achieve the most accurate position for each sample. A position was recorded when the sampling device first impacted the sediment surface. Horizontal positions were acquired using a Trimble AG132 DGPS. Real-time differential corrections were obtained from the CORS at Appleton, WA.

The Trimble GPS receiver output the station position to the integrated navigation software package. The GPS receiver displayed and transmitted data to the computer in NAD83 geographic coordinates.

The integrated navigation system, acting as a data manager, displayed the vessel's position relative to a proposed sampling location in plan view on a video screen. The screen display and numeric navigation data, including range and bearing to the target sampling location, assisted the vessel operator in approaching and maintaining a station position while sampling. The positional data from these units were recorded directly into the field logs during sample acquisition. Both target and actual geodetic coordinates for all stations sampled, including field replicates, are provided in Table F-1 (Appendix F).

3.2.4 Trimble Geo XT DGPS Unit Using TerraSync Pro and Laser Finder -- Collocated Sediment

The navigation to collocated surface sediment target locations at clam sampling station GCA12E was hampered by the existence of a concrete overpass (exit ramp from Interstate Highway 5 South onto Interstate Highway 84 East) above the sampling area, making it difficult to obtain satellite signals.

A laser finder TruPulse 360B (Laser Technology, Inc. Colorado) connected via Bluetooth[®] wireless communication to a Trimble Geo XT DGPS handheld unit was used to obtain accurate boat positioning with clear satellite signals from an onshore location away from the underpass. The on-land navigator kept constant communication with the pilot aboard MSS's sampling boat *Peter R* via cell phone. By constantly firing the laser finder on the boat structure, the actual position of the boat on the water was monitored by observing its location on a map in TerraSync with the handheld Trimble Geo XT unit. TerraSync was pre-loaded with the target locations and the on-land navigator would report back to the boat pilot with distance and bearing until the boat

was on target. Once the boat obtained a sediment grab, the on-land navigator recorded the actual coordinates of the sample in TerraSync. The same procedure was repeated for every target sample location at this site.

The TruPulse 360B laser finder provides 3-axis monitoring of the earth's magnetic field and uses TruVector compass technology and calibration algorithms to produce accuracies of ± 1 ft distance, ± 0.25 inclination and ± 1 degree azimuth.

Pathfinder 3.0 was used for post-processing data corrections of collected GPS positions. The base station used for the post-processing correction was USFS/BLM, Portland, OR, which references the horizontal datum of WGS84. After post-processing data corrections, the accuracy of actual GPS coordinates was on the order of ± 1 meter. The post-processed .cor file was exported from Pathfinder 3.0 to an ESRI shapefile format.

3.3 FISH AND INVERTEBRATE TISSUE AND COLLOCATED SEDIMENT SAMPLING METHODS

Fish and invertebrate tissue sample collection and processing generally followed the procedures specified in the Round 3B Biota FSP, Round 2 QAPP, and QAPP Addendum 9. Deviations from the FSP and QAPP are discussed in Section 3.10.

In order to use an electrofishing boat to capture smallmouth bass and carp, the LWG applied for permits for direct take and "incidental take" under Section 10 of the Endangered Species Act (ESA) of 1970. This permit allows activities that may impact listed species. In addition to Section 10 permits, NOAA Fisheries approved a permit for scientific research and monitoring activities under ESA Section 4(d) (50 CFR Part 223). Section 4(d) prohibits any take of endangered-listed species, but allows for take of some threatened species that do not interfere with salmon survival and recovery. Copies of the permits are found in Appendix G.

The Section 10 fishing permit was not granted to LWG in time for fishing to occur between mid-August and October 31, 2007, and electrofishing boats were not used to collect smallmouth bass and carp within the proposed Portland Harbor area. In addition, the ODFW (Salem, OR) was not able to assist by providing the LWG with a fish biologist who had a 2007 Section 10 fishing permit. Instead, the LWG asked the OBPC to assist in the collection of carp and smallmouth bass by angling. Additional carp and smallmouth bass were also caught using set lines.

A final report on fish take for this sampling event was submitted to ODFW by EES, and a copy of the report is provided in Appendix G.

Fish and invertebrate tissue samples for chemical and conventional analyses were collected using the following methods.

3.3.1 Crayfish Sampling Methods

Medium-size Promar® collapsible minnow traps were used to capture crayfish and sculpin. Bait consisted of commercially available frozen smelt and shad. The bait was cut into small pieces and placed into bait bags which were built into the minnow traps.

The traps were deployed within 100 ft of the shoreline at marked crayfish or sculpin stations. Stations were marked in 100-ft widths along the shoreline. Three traps were deployed overnight at each site, and depth of deployment varied according to station bathymetry.

Traps were retrieved the next day and carefully rinsed before being placed inside the boat. Technicians wearing powder-free nitrile gloves retrieved crayfish and sculpin from traps and placed them inside clean plastic tubs. The total length of each crayfish and sculpin was measured and recorded. Crayfish measuring at least 100 mm and sculpin measuring at least 90 mm were retained for sample processing, while those of insufficient length were released. The approximate weight of each retained specimen was determined using a fish scale (Pesola™ scale of 60 g [0.5-g resolution]).

Crayfish and sculpin were then wrapped in aluminum foil and placed inside a resealable plastic bag. This bag was then placed inside another resealable plastic bag containing a label marked with the date, time, station number, fishing technique code, event number, and initials of the sampler. Specimen bags were kept on wet ice until returning to the field lab.

3.3.2 Sculpin Sampling Methods

Sculpin were collected using four different sampling techniques. Occasionally, sculpin were collected in crayfish traps or by angling as described in Sections 3.3.1 and 3.3.3. However, most sculpin were collected using set lines or backpack electrofishing. These two methods are described below.

Set Lines

Set lines, also known as trot lines, were built with 50- to 80-lb braided Dacron line with nylon monofilament leaders. Each set line was approximately 150-ft-long and equipped with 25 to 30 #4 and #6 hooks. For sculpin and smallmouth bass, hooks were baited with earthworms purchased from Estacada Tackle Shop¹. Set lines were spread out at the bottom with both ends attached to lead weights, which in turn were attached by a line at each end to floats at the surface.

ODFW required that the first set lines be deployed for the duration of 2 hours at a time to ascertain that no endangered species would be caught at the sampling stations. After

¹ Estacada Tackle Shop, Estacada, OR. Phone: (503) 630-7424.

none were caught during the initial trial period of 2 days (August 27 and 28, 2007), set lines were left onsite overnight and retrieved the following day.

Technicians wearing powder-free nitrile gloves slowly retrieved the line, unhooked the fish, and placed them inside a clean plastic bucket. Often times, it was difficult to remove a hook without damaging a fish sample. In this situation, it was necessary to cut the nylon leader as far away from the mouth as possible, making it easy to identify a fish in need of hook removal during sample processing at the field laboratory. All fish containing hooks were noted in the field notebook.

The bucket with fish was then handed over to the fish-processing team. The total length of each fish was measured on a clean measuring board and weighed using a fish scale (Pesola™ scale of 60 g [0.5-g resolution]). Subsequently, the fish were wrapped in foil and immediately placed into individual resealable plastic bags containing a label marked with the date, time, station number, fishing technique code, and initials of the sampler. The fish were then placed in a cooler with ice and transported to the field lab for further processing.

Backpack Electrofishing

Backpack electrofishing was performed with a Smith-Root Model 12 with a 24-volt battery. The output voltage range varied from 300-400 volts, depending on water conditions. The pulse range varied between I-4 (60 Hz at 4 ms) and K-6 (80 Hz at 8 ms). A second backpack unit, model LR-24 was also used (400 volts, 60 Hz and 25% duty cycle) for collection of sculpin. The time spent electrofishing was recorded in seconds at electrofishing stations to determine catch per unit effort.

The backpack electrofishing team consisted of three technicians wearing chest waders and insulated electrical safety gloves. One technician carried the backpack unit holding the anode wand in one hand and cathode "tail" dragging behind in the water. The other two technicians held a dip net and a plastic bucket. Once a fish was stunned, it was scooped with the dip net and placed inside the plastic bucket. The bucket with fish was then handed over to the fish-processing team. The fish were measured, weighed, wrapped, labeled, and transported to the field lab for further processing as described above for sculpin caught by electrofishing.

3.3.3 Smallmouth Bass and Carp Sampling Methods

Smallmouth bass were collected by angling, backpack electrofishing, and set lines. However, they were collected most successfully by members of the OBPC on rod and reel using standard 2-inch commercial crank bait. Bait colors used were orange, chartreuse, and red. Fishing was also successful using 3.5-inch tube jigs and corn kernels. Fishing occurred from 7:00 AM until 4:00 PM each day.

Crank bait was cast toward the shoreline from an 18-ft-long bass boat controlled with a bow-mounted electrical engine. The average distance between the boat and the

shoreline was approximately 30 ft, and water depth varied from a few inches to about 16 ft. Crank bait was allowed to bump on the riverbed as the bait was retrieved back into the boat, enticing the smallmouth bass to bite.

Carp were collected by first chumming the area with canned corn kernels. Approximately one hour after chumming, the boat returned to the site and collected the carp with rod and reel by piercing several corn kernels through a fishing hook. A #6 hook was placed about a foot above a 1- to 3-oz lead weight and cast directly into the chummed area from the same boat.

Once caught, fish were immediately placed inside clean plastic totes, handled using powder-free nitrile gloves, and unhooked. The total length of each fish was then measured on a clean measuring board and weighed. Subsequently, the fish were wrapped in foil and immediately placed into individual resealable plastic bags containing a label marked with the date, time, station number, fishing technique code, and initials of the sampler. The fish were then placed in a cooler with ice and transported to the field lab for further processing.

3.3.4 Clam Sampling Methods

Clams were collected at each of the 10 locations by towing a benthic sled over the river bottom. Each tow was initiated by lowering the sled to the bottom, letting out sufficient rope to maintain a scope² of approximately 1:4 throughout the tow, and initiating the navigation system to track the tow line. The sled was then towed over the bottom for approximately 1 minute before it was slowly winched to the surface of the water. The contents of the sled bag were sieved outboard by moving the sled back and forth through the water. When the contents had been sieved as much as possible in the sled bag, the sled was lifted on board, and the contents of the bag were transferred into a large 0.5- or 1.0-mm sieve. At this point, the sieve was transferred to the processing boat, and another tow was initiated.

Tow information at each station, including number of tows, tow durations, scopes, and sampling depths, is summarized in Table 3-8 and presented in Figure 3-4a-j. The positional data from these units were recorded directly into the field logs during sample acquisition. Both target and actual geodetic coordinates for all stations sampled, including field replicates, are provided in Table F-1 (Appendix F).

3.3.5 Collocated Surface Sediment Sampling Methods

Collocated surface sediment sampling for sculpin, crayfish, and clams was accomplished using either a 0.1-m² van Veen grab sampler or a 0.3-m² hydraulic power grab sampler.

² The scope is the ratio of water depth to the length of the rope let out (i.e., a 1:4 scope is 1 meter water depth to 4 meters of rope let out).

Sculpin and Crayfish Collocated Sediment

Collocated surface sediment sampling for sculpin and crayfish were collected using a 0.1-m² van Veen grab sampler deployed from an A-frame installed at the bow of the *Local Motion* (ME). After the sampling equipment was deployed, the actual position was recorded when the equipment was on the riverbed. All samples were collected within 5 meters of the target sampling location except where noted in Section 3.10.

Once the sampler was brought on board, it was placed on a stand or a sediment tray. The overlying water in the sampler was siphoned out, and a visual characterization of the sediment surface was performed to ensure that the sample met the acceptability criteria described in the Collection of Surface Sediment Standard Operating Procedure (SOP) (Appendix D of the Round 3B Biota FSP). The top 10 cm of sediment were collected from each acceptable grab sample for chemical analysis. Sediment was collected and stored in a large stock pot prior to homogenization. Once the required sediment volume had been collected, the sediment was homogenized and separated into the laboratory-supplied sample containers.

A minimum of three consecutive casts of the grab was attempted at each target sampling location within a station. If a successful grab could not be taken (e.g., due to bottom debris, gravel, or because access was obstructed), the sampling effort was moved to an alternate location that was still within the overall defined target sampling area approved by EPA and its partners.

Three surface sediment grabs per 100 ft of sampling area were composited at each sculpin and crayfish sampling station as described in the Round 3B Biota FSP.

Clam Collocated Sediment

The collection of collocated sediment samples at each clam location was based on a location-specific sampling approach developed in consultation with the EPA agency team. At each sampling station where clams were successfully collected, the riverbed area trawled by the benthic sledge defined the target sampling area. Each successful trawl line defined the target locations for the collection of collocated sediment. These trawled areas varied in size and shape from location to location as a function of the search effort needed to collect sufficient clam biomass. Based on a map showing the on-bottom sledge trawled lines from which clams were collected at each station, a maximum of seven sampling target points were selected in consultation with EPA. An effort was made to situate the target for collocated sediment grab locations proportionally to the areas where the clams were collected. The individual collocated sediment grab samples were combined and homogenized to generate one composite sample per station.

Collocated surface sediment for clams was collected using a 0.1-m² van Veen grab sampler deployed from MGS's Woolridge jet boat or a stainless-steel, 0.3-m² hydraulic power-grab sampler from MSS's *Peter R*. Prior to sampling, target location station coordinates were entered into the navigation system. After the sampling equipment was

deployed, the actual position was recorded when the equipment was on the riverbed. All samples were collected within 5 meters of the target sampling location except where noted in Section 3.10.

Depending on bottom sediment composition, between three and seven individual sediment samples were composited at each clam sampling station as described in the Round 3B Biota FSP. The individual GPS coordinates for each sampling location where a sediment grab subsample was taken within each station are presented in Table F-1 and summarized in Table 3-6. The grab sampling locations at each station are presented in Figure 3-4a-j.

Once the sampler was brought on board, similar procedures as described above were followed to process sediment samples.

3.4 SAMPLE IDENTIFICATION SCHEME

As described in the Round 3B Biota FSP, each sample was assigned a unique identification code based on a scheme designed to meet the needs of field personnel, data management, and data users. This code indicates the project phase, sample type and location, and level of replication/duplication. Identification numbers for each target location are listed in Tables 3-1 through 3-6 and mapped in Figure 2-1a-d.

For clams, this code indicates the project phase, sample type and location, and the composite and depuration status. As an example, the sample ID for the depurated clam sample collected offshore of Terminal 5 was LW3-CA01E-C00D. The last four characters indicate that the sample is a composite ("C"), has no field replicate or duplicate ("00"), and the clams were depurated ("D"). The sample ID for a nondepurated sample offshore of Terminal 5 was LW3-CA01E-C00.

Collocated surface sediment samples were identified with a G, for sediment grab, placed in front of the species' name characters. For example, collocated surface sediment collected at the clam sampling station on the west side of RM 4 was LW3-GCA04W-C00.

3.5 EQUIPMENT DECONTAMINATION PROCEDURES

All field equipment used to collect and process fish was decontaminated according to the Fish Tissue Processing and Shipping SOP (Appendix C of the Round 3B Biota FSP). The benthic sledge used to collect clams and the sediment grab samplers (i.e., van Veen grab and hydraulic power grab) used to collect the collocated sediment were decontaminated according to procedures in the Round 2 Sampling of Benthic Invertebrate Tissue FSP (Windward and Integral 2005). Deviations from the standard procedures are noted in Section 3.10.

3.5.1 Fishing Gear and Field Processing Equipment

All buckets, measuring boards, handheld scales, and coolers used to retrieve and store fish were washed with Alconox™ soap and rinsed in site water before the sampling effort was initiated at each station. The benthic sledge and sieves were also washed with Alconox™ soap and rinsed in site water before the sampling effort was initiated at each station.

3.5.2 Field Lab Fish Processing Equipment

Decontamination of laboratory equipment and laboratory fish handling followed the instructions of the Fish Tissue Processing and Shipping SOP. All surfaces were covered with clean aluminum foil with the dull side up prior to contact with fish samples.

3.5.3 Collocated Surface Sediment Sampling Equipment

The sediment grab samplers (i.e., van Veen grab and hydraulic power grab) were washed with Alconox™ soap and rinsed in site water before the sampling effort was initiated at each station.

3.6 TISSUE PROCESSING PROCEDURES

The following sections describe field laboratory facilities and procedures for processing fish and invertebrate samples.

3.6.1 Field Laboratory Location and Facilities

The LWG field laboratory is located at 1991 NW Upshur Street in Portland, OR. The laboratory has a “clean room” for fish processing that was thoroughly cleaned prior to sample processing. The clean room had a positive pressure system to prevent outside dust particles from depositing onto fish samples during processing. The laboratory was also outfitted with a large supply of de-ionized (DI) water provided by Columbia Analytical Services (CAS), two sinks, and all laboratory safety equipment listed in the Fish Tissue Processing and Shipping SOP (Appendix C of the Round 3B Biota FSP).

The decontamination of laboratory equipment and laboratory fish handling followed the instructions of the Fish Tissue Processing and Shipping SOP. Technicians from SWCA were responsible for all fish processing at the field laboratory.

3.6.2 Whole-Body Fish Processing

All surfaces were covered with clean aluminum foil with the dull side up prior to contact with fish samples. Fish were removed from the refrigerator and carried into the fish processing clean room. The following procedures were followed:

- Whole-body fish were unwrapped and inspected for the presence of hooks.
- Any hooks present in the fish, due to being caught on a set line, were removed prior to weighing.
- Whole-body fish were weighed on a digital balance. Any fish that exceeded the capacity of the digital balance (3000 g) were weighed on a seed scale (Morris Scale Model 20, 20 lbs x 1 oz, temperature compensated) and the weights converted to metric. The weight was noted in the laboratory processing notebook and the sample processing form.
- Fish length was determined by using a measuring board covered in aluminum foil.
 - Total length was measured from the tip of the snout to the end of the caudal fin, when compressed dorsal-ventrally. The length was determined by marking the end of the tail with a sharp object and folding the aluminum foil at that point to read the ruler.
 - Fork length was measured from the tip of the snout to the fork of the caudal fin, with the fin extended. The length was determined by marking the end of the tail with a sharp object and folding the aluminum foil at that point to read the ruler. For fish with a highly preyed upon or eroded caudal fin, the fork length measurement represented a best estimate of length.
- The fish were examined for observable anomalies, using the Fish Health Examination Sheet (Appendix B of the Round 3B Biota FSP) as a guide, and the condition was noted in the laboratory notebook (Field Laboratory Notebooks, Appendix B of this report). Entries were descriptive (e.g., “2 mm red spot on distal end of caudal fin ray 2”).
- Whole-body fish were then re-wrapped in clean aluminum foil, shiny side away from the fish, and put into an appropriately sized bag with the bagged sample label that was written by the field crew. The bag with fish and label was sealed according to the Fish Tissue Processing and Shipping SOP.

3.6.3 Fish Fillet Processing

Fish filleting was performed on smallmouth bass and carp only. If an individual fish was to be filleted, that fish would be measured and weighed according to the initial procedures described in Section 3.6.2 for whole-body fish. The fish were then filleted according to the instructions in the Fish Tissue Processing and Shipping SOP and the fillets and bodies were weighed as follows:

- Weight of the two fillets (F) was measured on clean aluminum foil on the digital balance and was recorded in the laboratory processing notebook and the sample processing form.
- Weight of the remaining body (B) was measured on clean aluminum foil on the digital balance and was recorded in the laboratory processing notebook and the sample processing form.
- The fillets were wrapped in clean aluminum foil, shiny side away from the tissue, and packaged with a new sample label.
- The remaining body was wrapped in clean aluminum foil, shiny side away from the tissue, and packaged with a new sample label.
- Each sample was then stored in a freezer (-20°C) at the field lab until further instructions for fish compositing were made.

3.6.4 Fish and Crayfish Tissue Composite Processing

Once all individual fish and crayfish were processed at the field lab and all data (i.e., whole-body lengths and weights, fillet weights, and geographical coordinates) were compiled, the data were provided to the ecological and human health risk assessors at EPA and LWG (John Toll of Windward and Laura Kennedy of Kennedy Jenks) for analysis. After agreement was reached on the final choices of individual fish and crayfish for each composite, the instructions were sent back to the field lab staff to assemble the final tissue composites.

After each tissue composite was assembled, a new label was created for that composite and placed inside the bag containing all individuals belonging to that composite sample. The selected composites were labeled as described in Section 4.7 of the Round 3B Biota FSP.

3.6.5 Clam Sample Processing

In the processing boat, each clam was taken out of the sieve and rinsed with site water. The length of the clam was measured to estimate the soft tissue biomass and the clam was placed in a clean, laboratory-supplied glass jar. The clams from each tow were kept in separate glass jars until the exact sampling location had been established, at which

point all clams within the designated sampling location were combined into one jar. The sampling location decision was made in the field, in cooperation with Joe Goulet and Eric Blischke from EPA. The soft tissue biomass of each clam was estimated based on length (anterior to posterior) measurements and the equation presented in the Round 3B Biota FSP. The length measurements and the estimated weights were recorded on the field collection forms (Appendix E).

When the sampling effort was completed at a station, the estimated total clam weight was assessed. If 70 g or less were collected at a given station, the clams were composited into a nondepurated sample, placed in a clean, laboratory-supplied, wide-mouth glass jar, and stored in a cooler with ice. If the estimated weight exceeded 70 g, the clams were split into two samples in the field so that one of the samples could be depurated. The individual clams were sorted by size and the nondepurated sample of approximately 70 g, representing the size distribution at the station, was composited first. The remaining clams were composited into the depurated sample. The clams for the depurated sample were placed in clean, laboratory-supplied jars with dechlorinated tap water. When necessary, several jars were used for clams in order to have enough space and water volume to depurate. A label was placed on each jar with the date, time, station number, number of clams, and the initials of the sampler. The jars, without lids, were placed upright in a cooler.

At one station (LW3-CA01E), sufficient clams were collected for a nondepurated clam sample, a nondepurated post-homogenization split sample, and a depurated clam sample.

At the end of each day, the coolers with depurated and nondepurated clams were brought back to the LWG field laboratory. Before transportation to the lab, lids were placed on the jars with the depurated clams. All clam jars for nondepurated clams were removed from the cooler at the lab, counted, and stored in the freezer at -20°C. All depurated clam jars were removed from the coolers at the lab, counted, the jar lids removed, and stored upright in a refrigerator to allow complete depuration. After depurating for approximately 24 hours, the clams were removed from the water and placed in a clean, laboratory-supplied, wide-mouth glass jar. A new label was placed on the jar with all sample information and indicated that the sample was depurated.

3.7 FIELD QUALITY ASSURANCE/QUALITY CONTROL

Field QA/QC samples collected in association with the Round 3B fish and invertebrate tissue and collocated surface sediment sampling effort are described below. Table 3-9 summarizes the number of samples collected by analyte group. The table includes the target field QC sample (e.g., replicate, rinsate blank) percentages and actual number of QC samples collected. Overall, the field QC program was implemented as defined in the Round 3B Biota FSP, the Round 2 QAPP, and QAPP Addendum 9.

3.7.1 Field Replicates and Split Samples

Split samples were collected for each tissue type and for collocated sediment. For tissue samples, CAS generated split samples after the samples selected for splitting were composited and homogenized. Split sediment samples were generated in the field after sample homogenization was completed. The overall frequency requirement for split samples of 5% of total samples (Integral and Windward 2004; Integral 2007a) was met for all sample types. Split samples are identified on Tables 4-1a and 4-1b.

Subsamples were requested by the EPA during the Round 3B biota sampling effort. EPA will receive 20 g of tissue for some of the clam composites depending on available tissue biomass, and for all of the bass and carp composite samples for their use (Table 4-1a).

3.7.2 Equipment Rinsates and Temperature Blanks

Inadvertent introduction of chemical contaminants during sampling and analytical activities is assessed through the analysis of rinsate blanks. One rinsate blank sample (LW3-GCRSP900) for the sediment compositing equipment was generated by rinsing the stainless-steel bowl and spoons with DI water provided by CAS and pouring the rinse into sampling bottles. An additional collocated sediment compositing equipment rinsate blank sample (LW3-GCA12E-901) was collected for the clam samples. The clams were not processed further in the field laboratory, so no rinse blanks were collected at the field laboratory.

Temperature blanks are used to measure the temperature inside the cooler upon receipt to the laboratory. One temperature blank was prepared and submitted with each cooler shipped to the analytical laboratory. The temperature blank consisted of a sample jar containing DI water and labeled "temp blank" and packed into the cooler in the same manner as the rest of the samples. The cooler temperature for frozen sediment samples was measured at the laboratory by enclosing a thermometer in the cooler for at least 10 minutes prior to reading the temperature.

3.8 SAMPLE HANDLING, STORAGE, TRANSPORT, AND CUSTODY

Sample handling and storage for all samples, as well as sample transport and custody, are described in the following sections.

3.8.1 Fish and Invertebrate Tissue Sample Handling and Storage

Fish and invertebrate tissue samples were processed and handled as described in Section 3.3 and 3.6. At the end of each day, samples were stored at $4 \pm 2^{\circ}\text{C}$ in refrigerators in the field laboratory and then processed by SWCA (Portland, OR) within 24 hours of collection, with one exception described in Section 3.10.3. Fish and crayfish samples were frozen upon completion of SWCA's sample processing procedures. Nondepurated

clam samples were frozen at the field laboratory on the day of collection, and depurated clam samples were frozen upon completion of the depuration procedures.

3.8.2 Collocated Surface Sediment Sample Handling and Storage

The sediment samples were homogenized by hand in a decontaminated, stainless-steel bowl, placed in clean and appropriately labeled 8-oz and 16-oz glass jars, and stored in a cooler with ice. The coolers were transported to the field laboratory at the end of the day. At the field lab, samples intended for CAS were stored under refrigeration, and archived samples and samples for analysis of polychlorinated biphenyl (PCB) congeners at Vista were stored frozen.

3.8.3 Sample Transport and Custody

A chain-of-custody (COC) form was prepared for all samples prior to shipment to the laboratories. Samples were packed and separated in the shipping container (ice cooler) by bubble wrap or other shock-absorbent material to prevent breakage. Loose ice was then placed in the cooler to maintain a temperature of approximately 4°C. A temperature blank was added to each cooler, and the associated COC forms were placed into a re-sealable bag and taped on the inside lid of each cooler. Each cooler was sealed with shipping tape, and three custody seals (including the project name, date of shipment, and the name of the person sealing the cooler) were affixed to each cooler. Samples were transported to CAS in Kelso, WA, directly by courier following shipping procedures in Fish Tissue Processing and Shipping SOP (see Appendix C of the Round 3B Biota FSP). Samples for Vista were shipped by FedEx for next-day delivery.

3.9 FIELD DOCUMENTATION

All field activities and observations were noted in bound Rite in the Rain[®] field logbooks (Appendix B). Information included personnel, date, time, station designation, sampler, types of samples collected, and general observations. Any changes that occurred at the site (e.g., personnel, responsibilities, deviations from the Round 3B Biota FSP) and the reasons for these changes were also documented in the field logbook.

A sample collection checklist was produced prior to sampling and completed following sampling operations at each station. The checklist included station designations, types of samples to be collected (e.g., one jar for metals), and whether blind field replicates or additional sample volumes for laboratory QC analyses were collected. These checklists were similar in content to the detailed sample analysis lists provided in Table 4-1a of this FSR. Occasionally, samples in the field or at the field lab were mislabeled or the same ID was assigned to different fish by different field crews. Sample identification codes were revised in these cases and all applicable field records were updated, with changes initialed and dated as specified in the Round 2 QAPP (Integral and Windward 2004).

Finally, a COC form was established in the field for each sample before it was shipped from the field to the analytical laboratories. A complete set of the project COC forms is maintained in the project file at Integral's Portland, OR office.

3.10 DEVIATIONS FROM THE ROUND 3B FSP

This section discusses fish and invertebrate tissue and collocated surface sediment sampling deviations from the Round 3B Biota FSP.

3.10.1 Sampling Method Deviations

No deviations from planned sampling methods occurred during the Round 3B fish and invertebrate tissue and collocated sediment collection field event.

3.10.2 Sample Station Deviations

The following sampling stations were modified from the final map produced after the reconnaissance trip with EPA on August 7, 2007 (Figure 2-1a-d):

- **CR01E and GCR01E:** Crayfish and collocated sediment stations CR01E and GCR01E were abandoned at their original location (Figure 3-1b) because of poor crayfish habitat. New sampling locations (CR01E-ALT and GCR01E-ALT) were positioned near the SP01E-ALT station (see Figure 3-1a).
- **SP05E and GSP05E:** Sculpin and collocated sediment stations SP05E and GSP05E were moved approximately 300 ft downstream of the target station (see Figure 3-1f) because of poor fish habitat at the original station.
- **CR10W and GCR10W:** Crayfish and collocated sediment stations CR10W and GCR10W were moved approximately 300 ft downstream of the target station (see Figure 3-1o) because of more appropriate crayfish habitat.
- **SP12W and GSP12W:** Sculpin and collocated sediment stations SP12W and GSP12W were abandoned and a new sampling station, SP012W-ALT, was created approximately 400 ft downstream of the old target station (see Figure 3-1r) because of poor fish habitat at the original station.

3.10.3 Other Deviations

The following are additional deviations from the Round 3B Biota FSP:

- Collocated sediment samples were collected at nine of the 10 clam stations between November 19 and 21, 2007. A ship covered the area at one station (GCA11E), and consequently, collection of the collocated sediment sample was postponed until December 6, 2007. The collocated sediment at this station was

collected with a power grab sampler instead of a van Veen grab sampler (see Figure 3-4i). Samples were collected approximately 40 ft from target due to inaccurate positioning of the dock structure in the NOAA charts used with the Nobeltec navigational software on board of the R/V *Peter R* (see Section 3.2.3).

- EPA requested that the collocated sediment sample collected from station GCA12E on November 20, 2007 be re-sampled because the original sediment sample was a composite of only three subsamples instead of the requested five subsamples, and because one of the three subsamples was collected at a location where insufficient representative clam biomass was collected. Subsamples at or close to the EPA target stations at GCA12E could not be successfully collected following more than 30 sampling attempts due to debris, gravel, and the slope of the target sampling areas. The final collocated sediment sample at GCA12E (LW3-GCA12E-C00-R) was collected on December 6, 2007, using a power-grab sampler (see Section 3.2.4 and Table 3-6).
- Filleting of smallmouth bass and carp was completed at the LWG field laboratory instead of CAS laboratory. This change was approved by EPA (Appendix A).
- Fish were not scaled prior to filleting as originally stated in the Round 3B Biota FSP. This procedure was approved by EPA (Appendix A). However, two smallmouth bass were scaled at the beginning of the sampling event, and one of these (LW3-SB09W-01) was included in a composite sample.
- Smallmouth bass LW3-SB09W-01 was originally caught on a set line at sculpin station SP08W on August 28, 2007 at 11:40 AM. At EPA's request, the fish was held for 48 hours at the field lab prior to processing to allow EPA to observe filleting procedures at that time. This fish was frozen after filleting and included in composite LW3-SB09W-C00.
- The first sculpin collected at SP09W (LW3-SP09W-1) on August 29, 2007 was incorrectly labeled as LW3-SP08W-01. This fish became part of the final LW3-SP08W-C00 composite sample (see Table 3-1). It accounts for 4.1% of sample weight. To account for this error, the tissue concentrations found at location SP08W will be proportionally adjusted for the concentration found at location SP09W according to the following equation: (SP08W tissue concentration - 0.04*SP09W tissue concentration)/0.96 (see Table 3-1).
- The eleventh smallmouth bass collected at SB11W (LW3-SB11W-11) on September 5, 2007 was incorrectly recorded as LW3-SB11E-01 at the field lab. This fish became part of the final LW3-SB11E-C00B and LW3-SB11E-C00F composite samples (see Table 3-3). Fish SB11E-01 (actually from SB11W) accounted for 15% of both sample types. To account for this error, the tissue concentrations found at location SB11E will be proportionally adjusted for the

concentration found at location SB11W according to the following equation:
 $(\text{SB11E concentration} - 0.15 * \text{SB11W concentration}) / 0.85$ (see Table 3-3).

Additional corrections in sample labeling during collection and processing were attributed to many factors and are displayed in Table B-1 in Appendix B. These changes were made prior to final sample compositing with the exceptions stated above.

4.0 LABORATORY ANALYSES AND DATA MANAGEMENT

This section summarizes the chemical analyses that will be performed for the characterization of fish and invertebrate tissue and collocated surface sediment samples. Table 4-1a-b lists the analyses to be conducted on each sample; analytical methods are compiled in Table 4-2a-b and Tables A6-3 and A6-4 of the QAPP (Integral 2007a).

Sediment and tissue samples from the Study Area will be analyzed for the following constituents as shown in Table 4-1a-b and Table 2-2 of the FSP (Integral 2007b):

- 209 PCB congeners
- PCB Aroclors (sediment samples only)
- Organochlorine pesticides
- Polycyclic aromatic hydrocarbons (PAHs)
- Alkylated PAHs (clam samples and all collocated sediment samples only)
- Butyltin compounds
- Phthalates, phenols, and additional semivolatile organic compounds (SVOCs)
- Metals, including mercury
- Chlorinated dioxins/furans
- Percent lipids (tissue samples only)
- Grain-size distribution and total organic carbon (TOC) (sediment only)
- Percent moisture.

4.1 CHEMICAL ANALYSIS

Laboratory analyses for the fish and invertebrate tissue and collocated surface sediment samples will be conducted according to the Round 3B Biota FSP (Integral 2007b) and the Round 2 QAPP Addendum 9 (Integral 2007a).

4.1.1 Fish and Invertebrate Tissue Samples

The laboratory methods for tissue sample preparation and analysis are summarized in Table 4-2a of this report and Table A6-3 of the QAPP. CAS (Kelso, WA) will homogenize the tissue samples and will provide subsamples of homogenized tissue for analysis at Axys Analytical Services, Ltd (Axys; Sidney, BC, Canada). CAS will

complete analyses for PAHs, alkylated PAHs (clam tissue only), butyltin compounds, phthalate esters and selected SVOCs, metals (including mercury), and percent moisture. Axys will complete analyses for lipids, PCB congeners, dioxins/furans, and organochlorine pesticides. All tissue data will be reported on a wet-weight basis.

4.1.2 Collocated Surface Sediment Samples

The laboratory methods for collocated sediment sample preparation and analysis are summarized in Table 4-2b of this report and Table A6-4 of the QAPP. CAS will complete analyses for organochlorine pesticides, PCB Aroclors, PAHs, alkylated PAHs, butyltin compounds, phthalate esters and selected SVOCs, metals (including mercury), dioxins/furans, TOC, grain-size distribution, and percent moisture. Vista Analytical (El Dorado Hills, CA) will complete analyses for PCB congeners for the collocated surface sediment samples. All sediment data will be reported on a dry-weight basis.

4.2 DATA MANAGEMENT

Once the laboratories have completed their internal QA/QC checks, they will submit the analytical data (sample, test, batch, and result information) into comma-delimited text files with data columns arranged in an order that is recognized by the project's Environmental Quality Information System (EQuIS) database. These electronic data deliverables (EDDs) are e-mailed to Integral where they are checked for proper EQuIS structure and appended with specific information that was not known by the labs, such as sampling location, composite information, and field replicate information. If any problems are found in the structure of the EDDs, then the laboratory is notified and asked to correct the problem and resubmit the EDD. Each e-mailed EDD transmission, with the original, unaltered EDD attachment, is stored to document and track the laboratories' delivery of electronic data to Integral.

When the EDDs are correct and complete, they are checked electronically by loading them into the temporary section of Integral's LWG project database. In the process of loading, EQuIS checks the EDDs for correct lookup codes (for analytes, test methods, and sample matrices); proper relationships for results, tests, batches, and samples (to ensure all results match with a test, tests with samples, and sample/test pairs with batches); and that all derived samples (such as replicates and matrix spikes) have corresponding parent samples.

In addition to these checks, EQuIS also checks "less important" characteristics, such as date and time formats and text field lengths, to ensure consistency throughout the database. Any error prevents the EDD from loading until the error is corrected. If errors are found that are related to the way the laboratory is reporting the data or constructing the EDD, then the laboratory is notified and asked to correct the problem and resubmit the EDD. If errors are related to Excel[®] automatically formatting date and time fields, for example, then the error is corrected and steps are taken to avoid repeats of the problem (such as changing default settings in the software). Successfully loaded

EDDs are saved to document and track the data that were loaded into Integral's LWG project database.

Each verified and accurate EDD is provided to the Round 3B data validation contractor (EcoChem, Seattle, WA) for data review and validation. These EDDs are also stored in a temporary section of the project database, where they can be queried and examined, if desired, until validation is complete. As EcoChem completes validation of the data by sample delivery group (SDG) or small groups of SDGs, the validation qualifiers and reason codes are applied to the data in the temporary section of the database. The validated data are then merged into the permanent project database. During the merging process, all previously performed electronic checks are repeated to ensure nothing was incorrectly modified with the application of the validation results.

Several queries have been set up in the permanent project database to translate the data structure to a form compatible with the NOAA Query Manager. The data translation includes creating station and sample identifiers, converting the sample type code, and changing the date format. The translated data are imported into an Access[®] file provided by NOAA that contains template tables for the Query Manager structure.

Integral's LWG project database contains all of the data reported by the analytical laboratories. This includes field and laboratory replicates, laboratory dilutions, results for the same analyte from multiple analytical methods (SW8270 and SW8270-SIM, for example), and laboratory QA samples such as matrix spikes, surrogates, and method blanks.

5.0 REPORTING

LWG-validated analytical laboratory data will be provided to EPA in an electronic format within 150 days of completion of the sampling event. A tissue and sediment data report will be developed within 90 days after the data have been validated. The chemistry results will be reported in tabular format in the data report. These data will also be incorporated into the RI report and baseline risk assessments, which will be prepared after all sampling and analysis rounds for the project are completed.

6.0 REFERENCES

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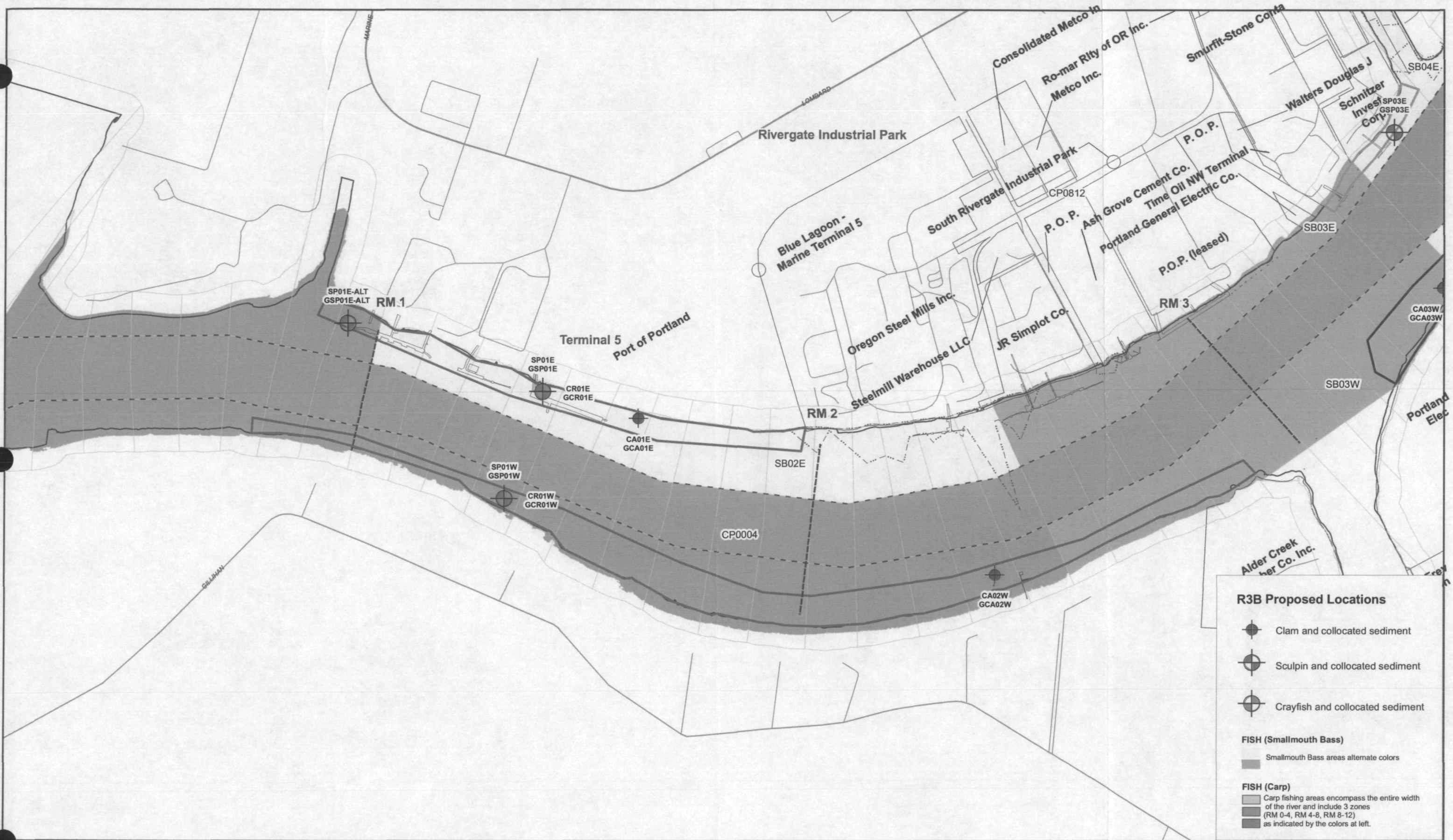
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Figures



Map Document: (P:\Projects\Portland_Harbor\LWG-Map-Projects\Round3_Tissue_B0101-589152007_R3B_Proposed EPA_Fish_Sampling.mxd)
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FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 200 400 600 800 1,000 Feet

Map Features:

R3B EPA Proposed Locations

- CLAMS, Crayfish, Sculpin
- CLAMS Only
- Clams Only
- Crayfish & Sculpin
- Clams & Crayfish
- Combined CA, CR, SP

iAOPC_Boundary
Bridges
Navigation Channel

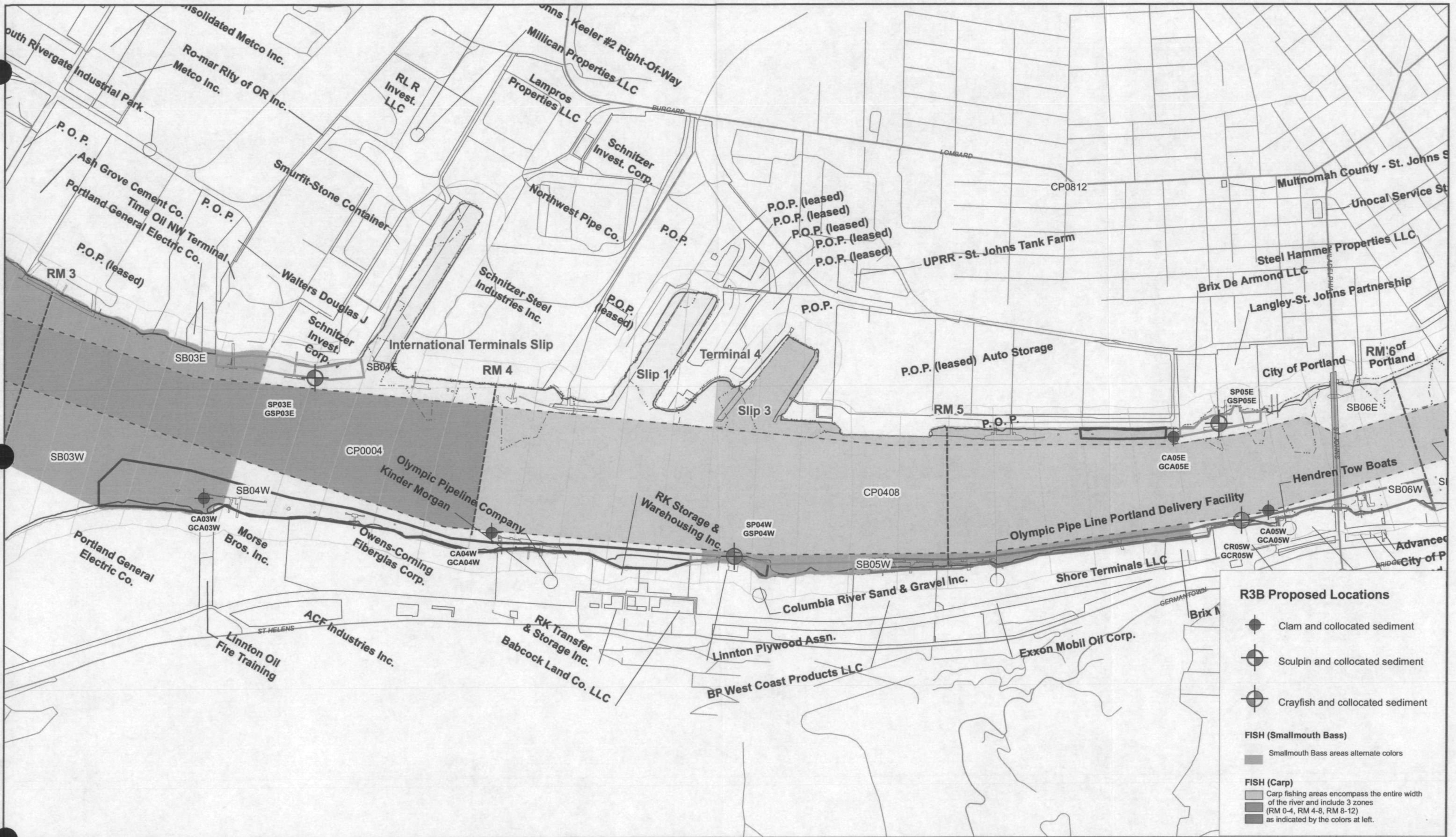
Sample ID Codes
CA = clam
CP = carp
CR = crayfish
SP = sculpin
G = surface sediment grab
E = east
W = west

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Figure 2-1a
Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
RM 0 to 3

Map Document: (P:\Projects\Portland_Harbor\WG-Map-Projects\Round3_Tissue_B0101-58152007_R3B_Proposed_EPA_Fish_Sampling.mxd)
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- R3B Proposed Locations**
- Clam and collocated sediment
 - Sculpin and collocated sediment
 - Crayfish and collocated sediment
- FISH (Smallmouth Bass)**
- Smallmouth Bass areas alternate colors
- FISH (Carp)**
- Carp fishing areas encompass the entire width of the river and include 3 zones (RM 0-4, RM 4-8, RM 8-12) as indicated by the colors at left.



FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS -
Channel & River miles: US Army Corps of Engineers.
Bathymetric Information: David Evans and Associates, Inc.

0 200 400 600 800 1,000 Feet

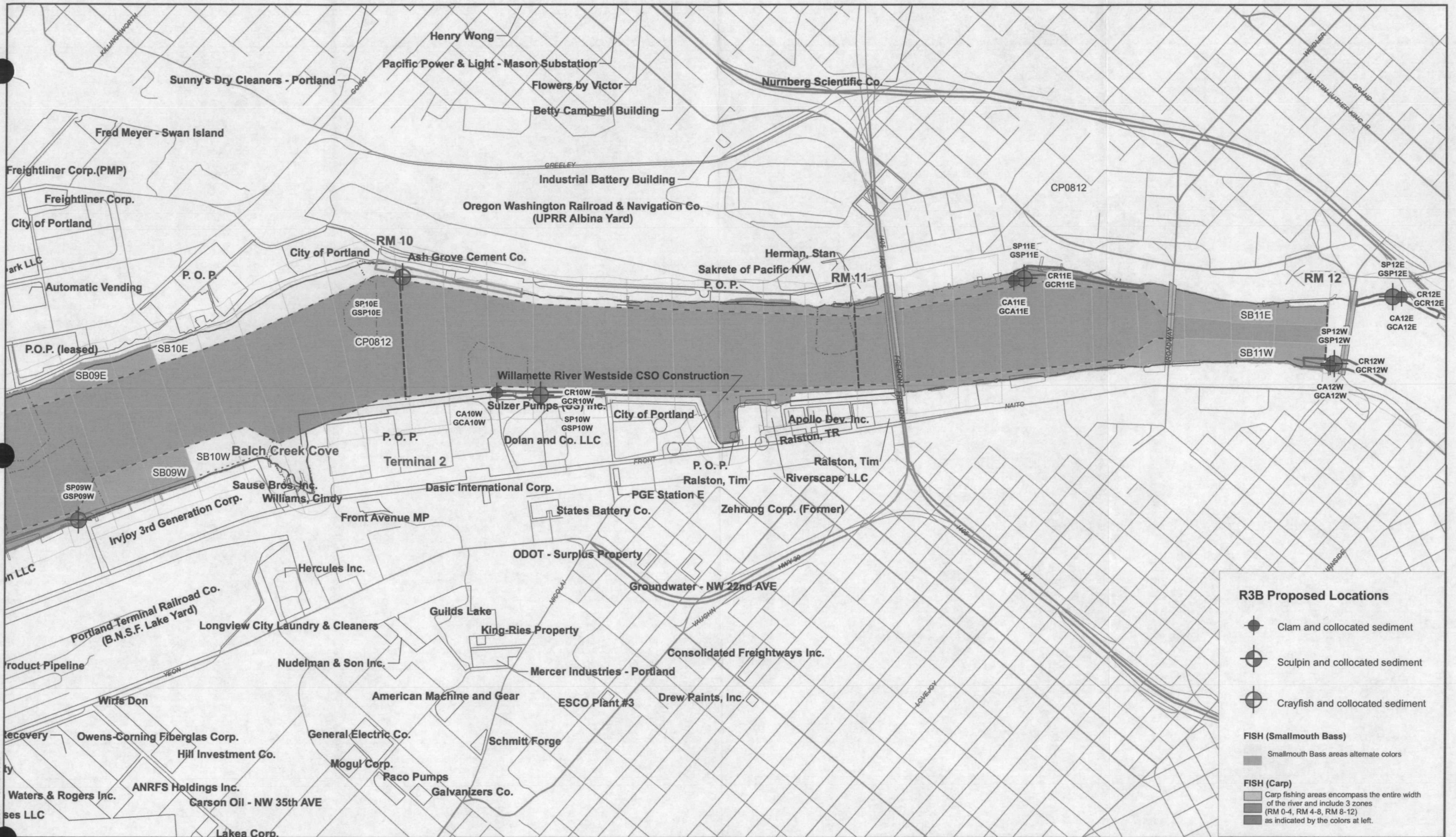
- Map Features:**
- R3B EPA Proposed Locations**
- CLAMS, Crayfish, Sculpin
 - Sculpin Only
 - Clams Only
 - Crayfish & Sculpin
 - Clams & Crayfish
 - Combined CA, CR, SP
- IAOPC_Boundary
 - Bridges
 - Navigation Channel

Sample ID Codes
CA = clam
CP = carp
CR = crayfish
SP = sculpin
G = surface sediment grab
E = east
W = west

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Figure 2-1b
Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
RM 3 to 6

Map Document: (P:\Projects\Portland_Harbor\Map-Projects\Round3_Tissue_B0101-5819152007_R3B_Proposed_EPA_Fish_Sampling.mxd)
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FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 200 400 600 800 1,000 Feet

Map Features:

R3B EPA Proposed Locations:

- CLAMS, Crayfish, Sculpin
- Sculpin Only
- Clams Only
- Crayfish & Sculpin
- Clams & Crayfish
- Combined CA, CR, SP

Legend:

- Navigation Channel
- Bridges
- Navigation Channel

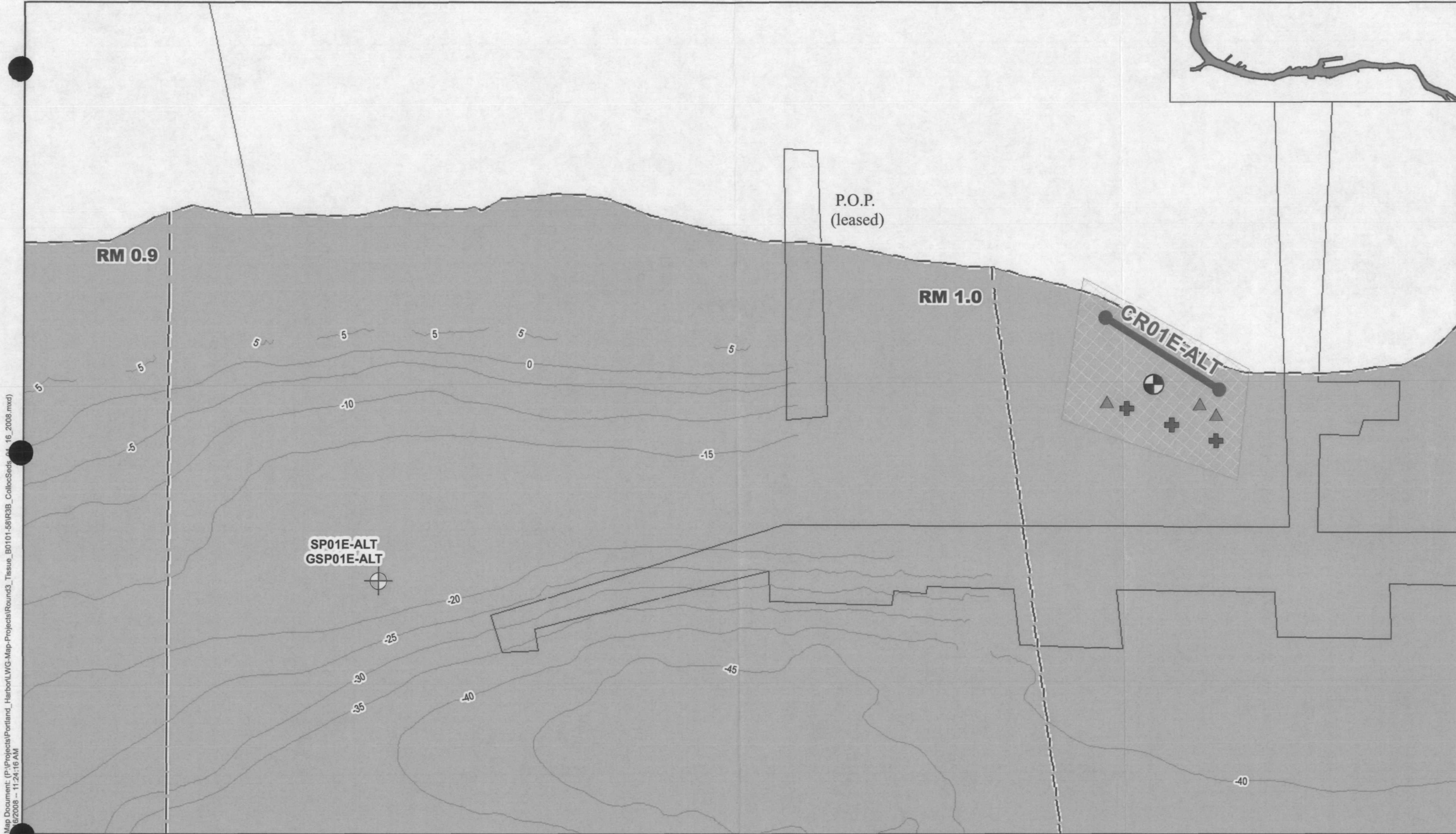
Sample ID Codes

- CA = clam
- CP = carp
- CR = crayfish
- SP = sculpin
- G = surface sediment grab
- E = east
- W = west

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Figure 2-1d
Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
RM 9 to 12



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Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

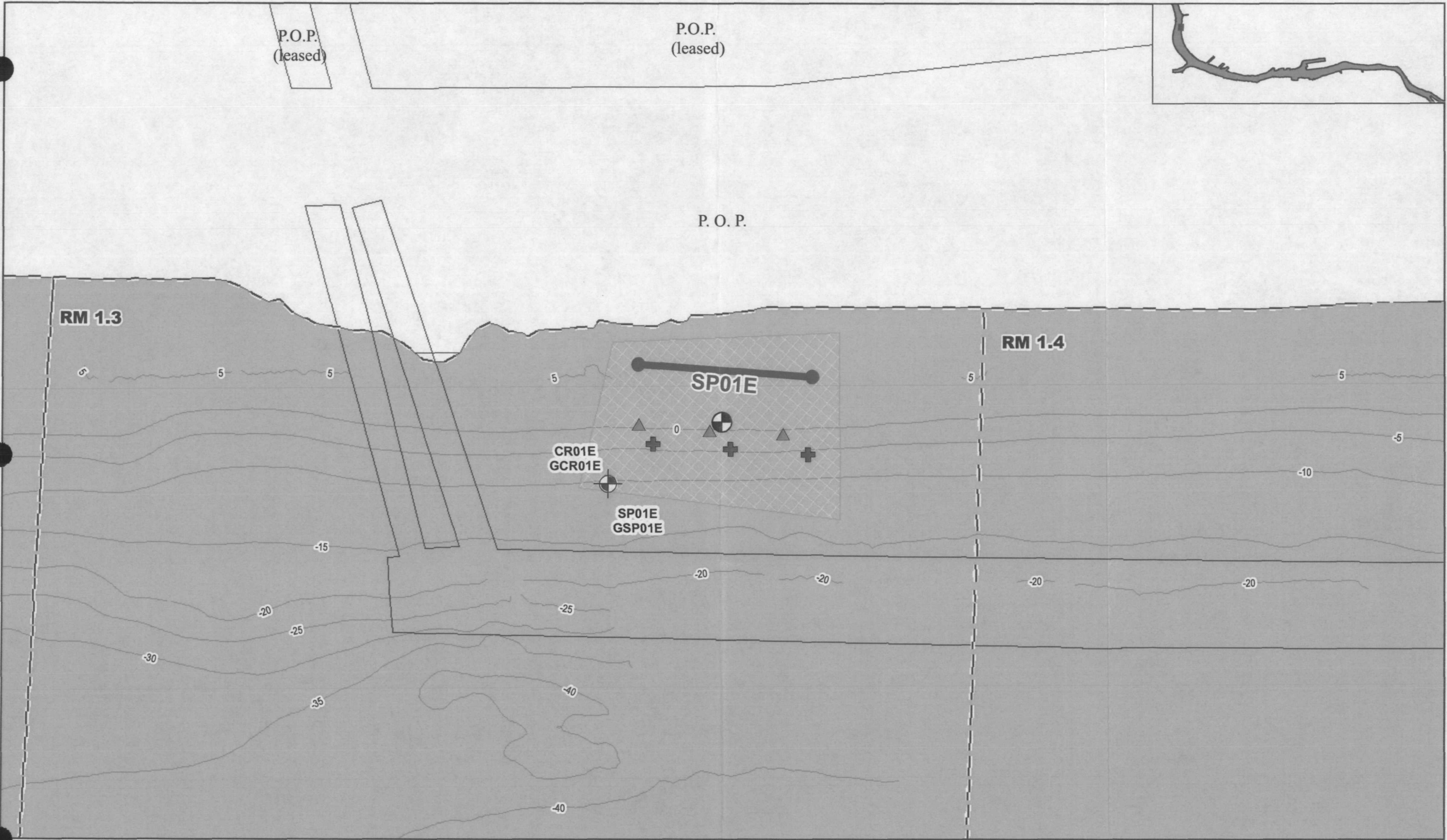
0 50 100 Feet

- ▲ Actual collocated sediment grab
- ⊕ Target collocated sediment grab
- ⊙ Centroid of approximate set line/crayfish trap fishing area
- Actual 100ft fishing zone for sculpin and crayfish
- Approximate set line/crayfish trap fishing area
- ⊙ R3B target sculpin and collocated sediment
- ⊙ R3B target crayfish and collocated sediment
- Map Features:
- iAOPC_Boundary
- ▬ Bridges
- ▬ Navigation Channel
- ▬ River Mile (tenths)
- 5 foot Contour (NAVD88)

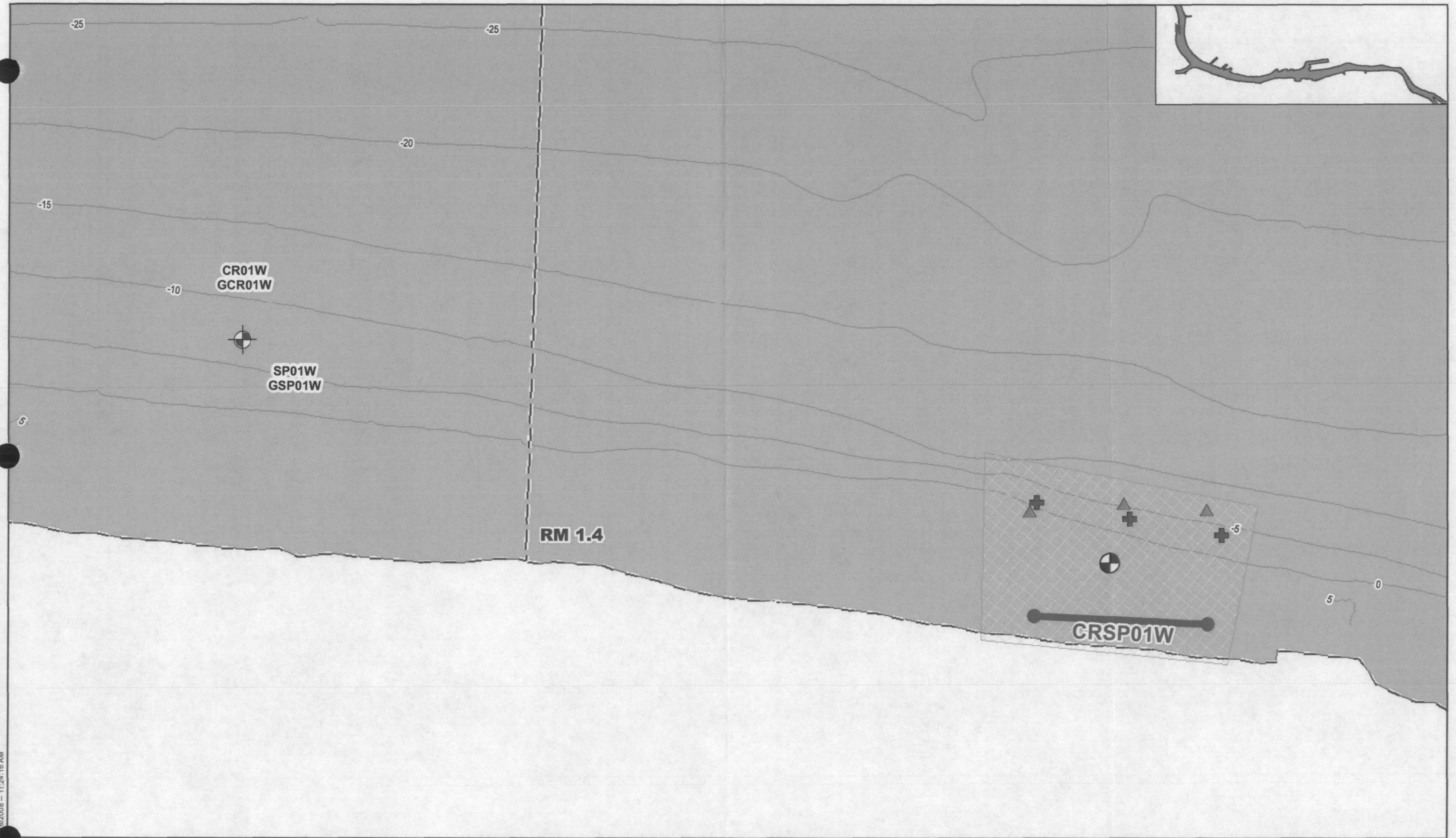
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Figure 3-1a
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
CR01E-ALT

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FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 Feet

- ▲ Actual collocated sediment grab
- ⊕ Target collocated sediment grab
- ⊙ Centroid of approximate set line/crayfish trap fishing area
- Actual 100ft fishing zone for sculpin and crayfish
- Approximate set line/crayfish trap fishing area

- ⊙ R3B target sculpin and collocated sediment
- ⊙ R3B target crayfish and collocated sediment

- Map Features:
- IAOPC_Boundary
 - ▬ Bridges
 - ▬ Navigation Channel
 - ▬ River Mile (tenths)
 - 5 foot Contour (NAVD88)

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Figure 3-1c
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
CRSP01W

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FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 Feet

- ▲ Actual collocated sediment grab
- ⊕ Target collocated sediment grab
- ⊙ Centroid of approximate set line/crayfish trap fishing area
- Actual 100ft fishing zone for sculpin and crayfish
- Approximate set line/crayfish trap fishing area

- ⊙ R3B target sculpin and collocated sediment
- ⊙ R3B target crayfish and collocated sediment

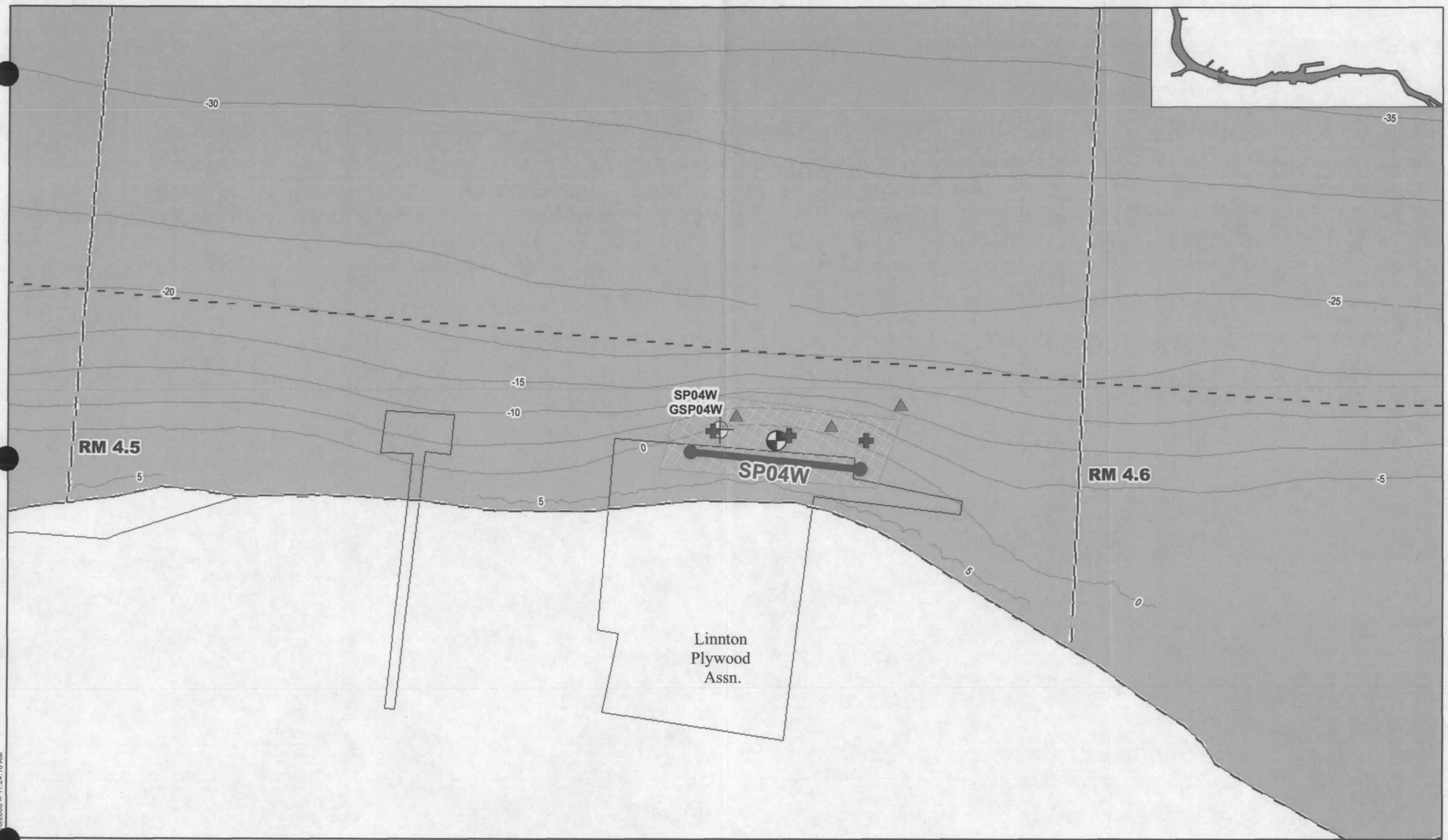
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 - ▬ Bridges
 - ▬ Navigation Channel
 - ▬ River Mile (tenths)
 - 5 foot Contour (NAVD88)

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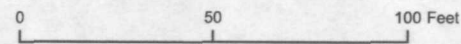
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Figure 3-1d
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
SP03E

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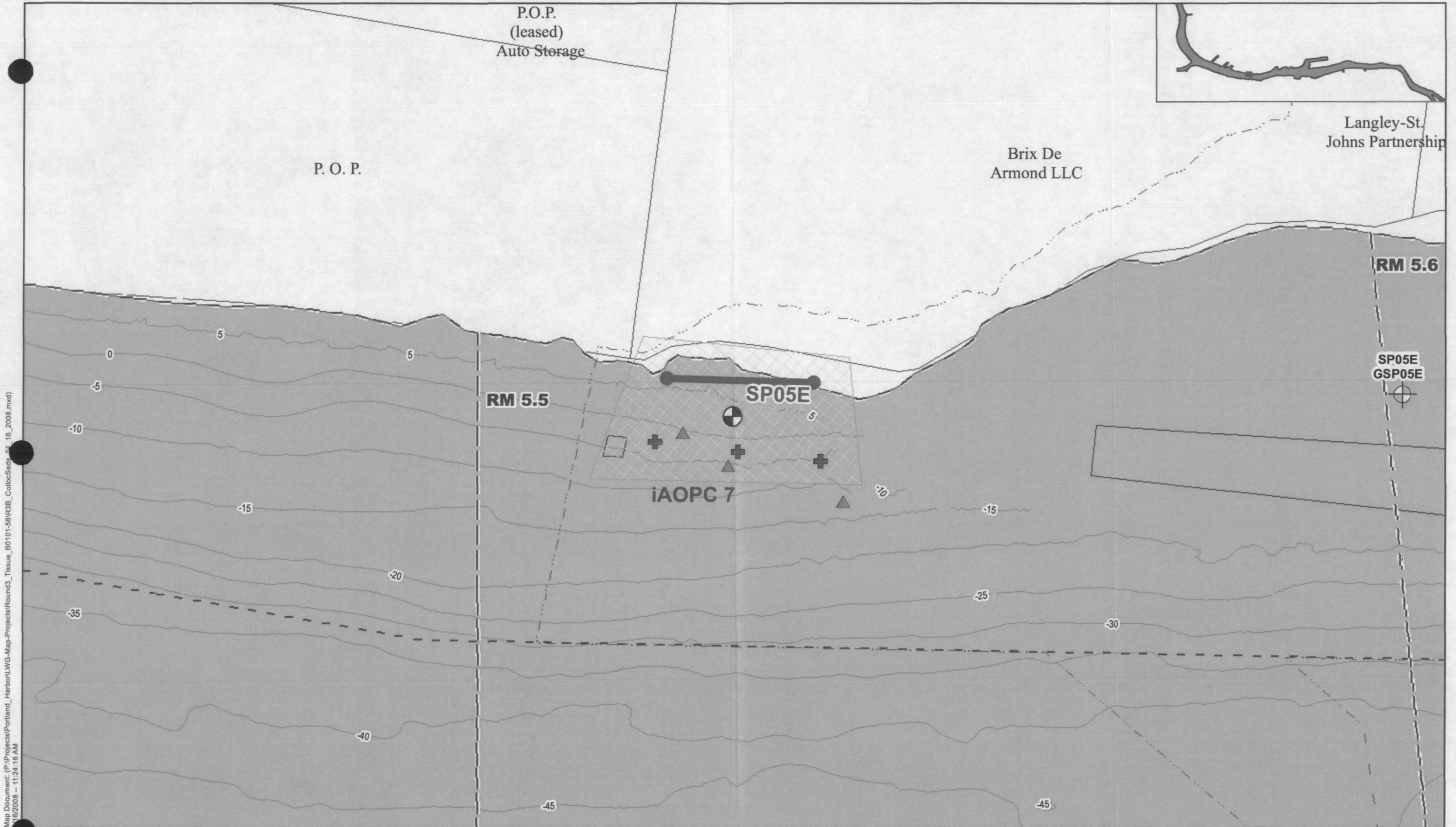
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Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.



- ▲ Actual collocated sediment grab
- ⊕ Target collocated sediment grab
- ⊙ Centroid of approximate set line/crayfish trap fishing area
- Actual 100ft fishing zone for sculpin and crayfish
- Approximate set line/crayfish trap fishing area
- ⊕ R3B target sculpin and collocated sediment
- ⊙ R3B target crayfish and collocated sediment
- ⋯ IAOPC Boundary
- ▬ Bridges
- ▬ Navigation Channel
- ▬ River Mile (tenths)
- 5 foot Contour (NAVD88)

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Figure 3-1e
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
SP04W



FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 Feet

- ▲ Actual collocated sediment grab
- ⊕ Target collocated sediment grab
- ⊙ Centroid of approximate set line/crayfish trap fishing area
- Actual 100ft fishing zone for sculpin and crayfish
- Approximate set line/crayfish trap fishing area

- ⊙ R3B target sculpin and collocated sediment
- ⊙ R3B target crayfish and collocated sediment
- Map Features:**
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- ▬ Bridges
- ▬ Navigation Channel
- ▬ River Mile (tenths)
- 5 foot Contour (NAVD88)

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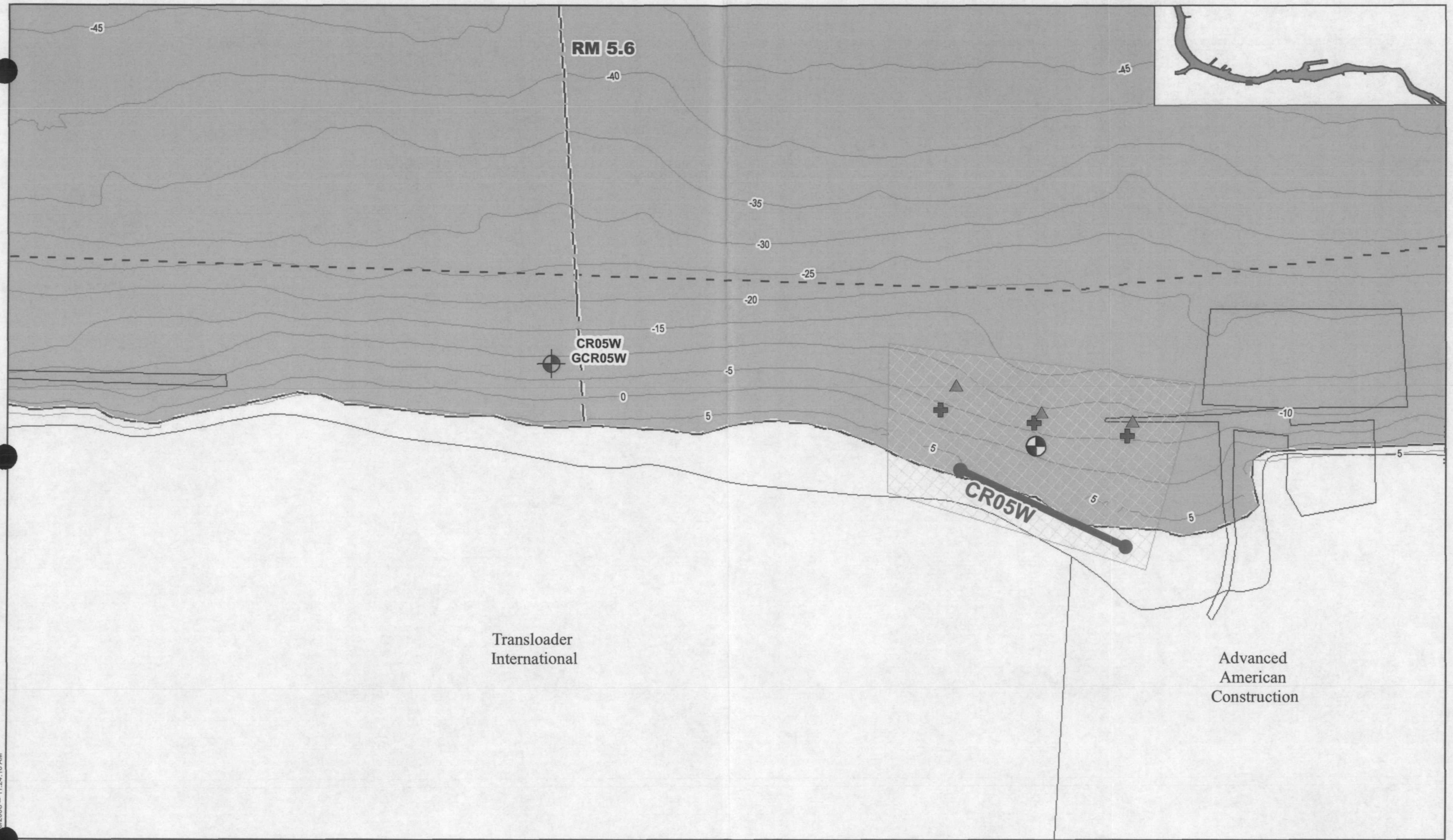
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Figure 3-1f
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
SP05E

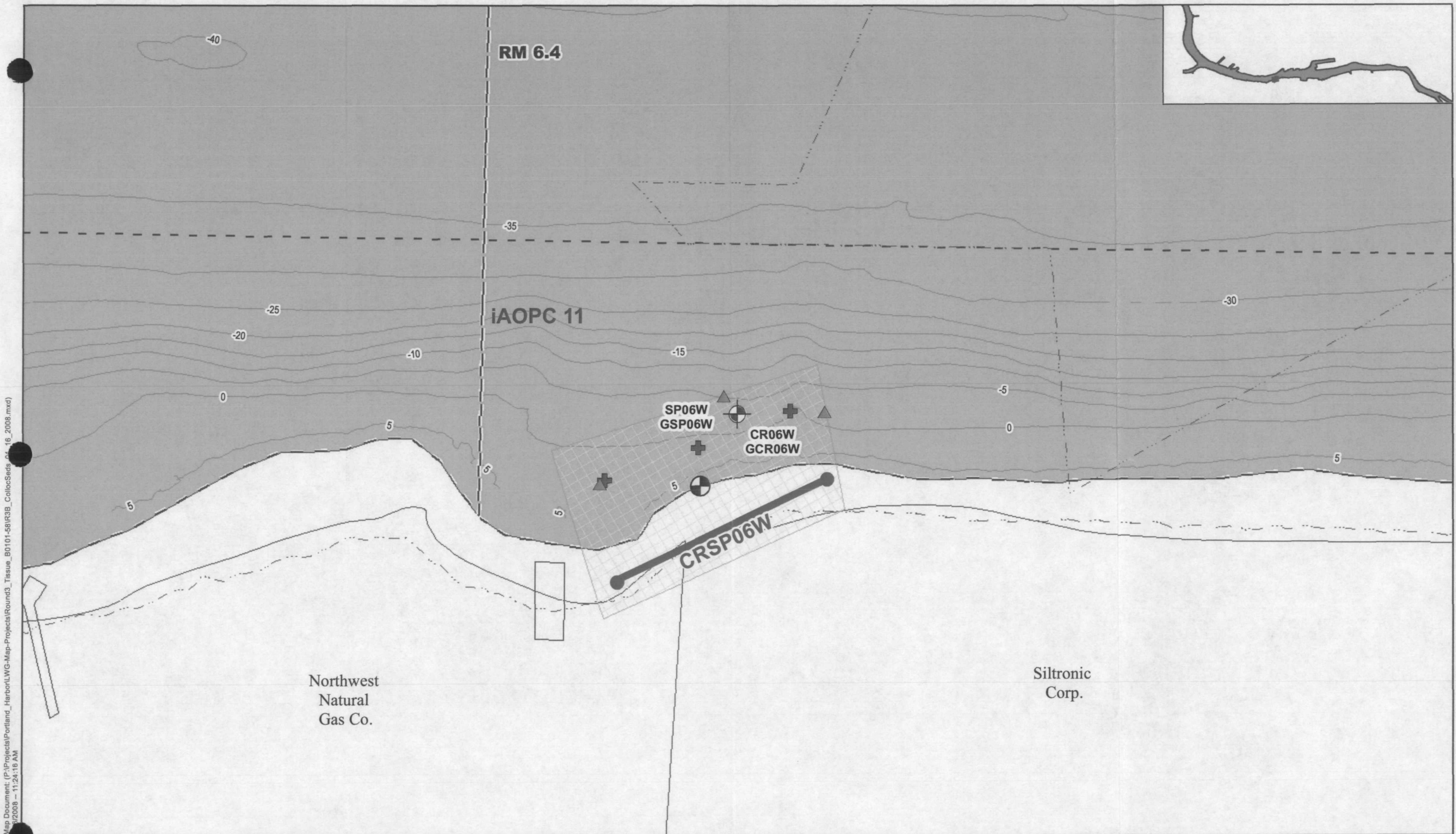
integral
consulting inc.

LWG
LOWER WILLAMETTE GROUP

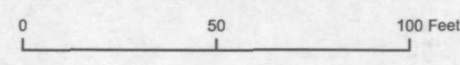
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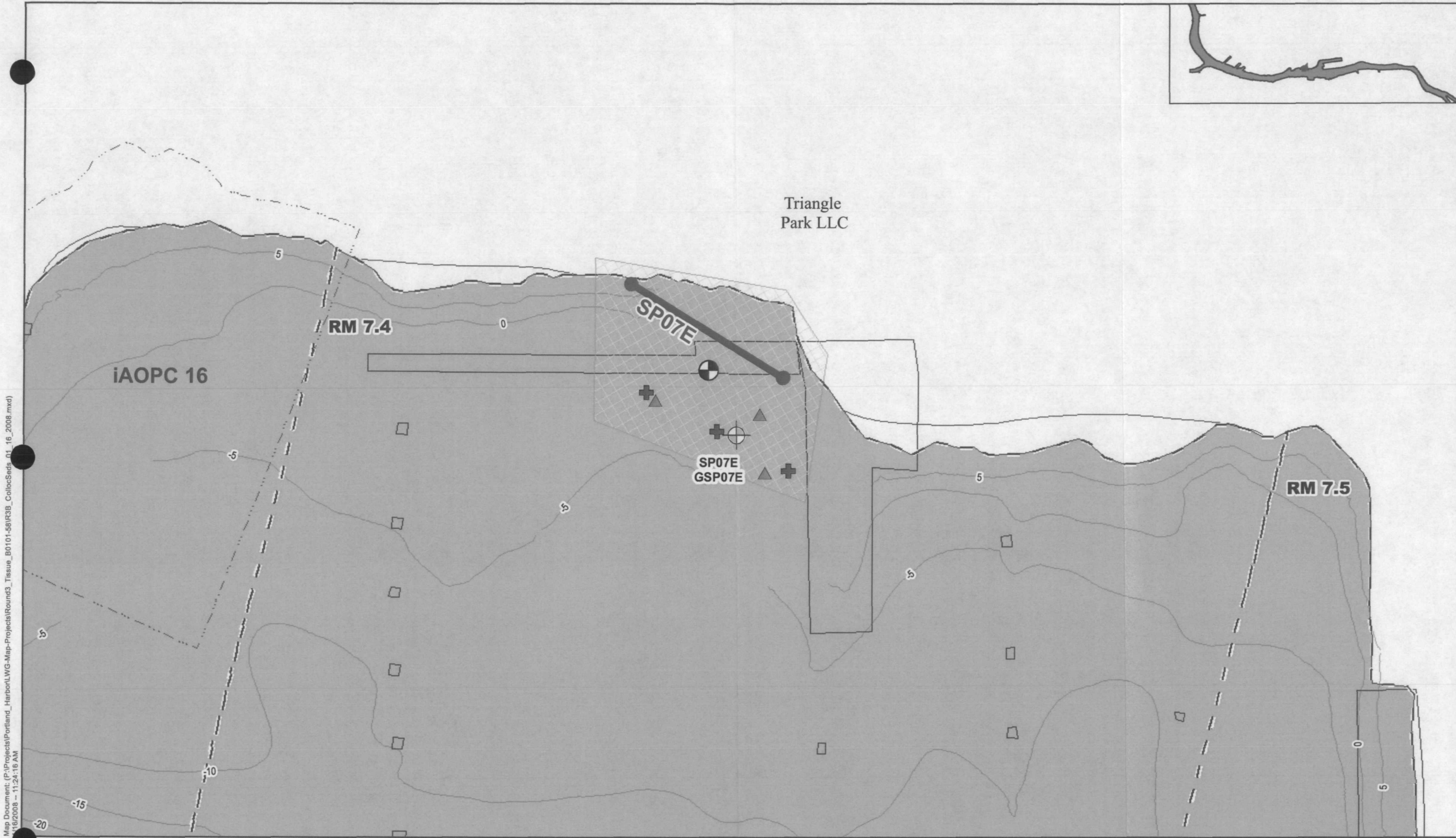
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Transportation, Property, or Boundaries: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.
Bathymetric Information: David Evans and Associates, Inc.



- ▲ Actual collocated sediment grab
- ⊕ Target collocated sediment grab
- ⊙ Centroid of approximate set line/crayfish trap fishing area
- ⊙ R3B target sculpin and collocated sediment
- ⊙ R3B target crayfish and collocated sediment
- IAOPC_Boundary
- Bridges
- Navigation Channel
- River Mile (tenths)
- 5 foot Contour (NAVD88)

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Figure 3-1h
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
CRSP06W



FEATURE SOURCES:
 Transportation, Property, or Boundaries: Metro RLIS .
 Channel & River miles: US Army Corps of Engineers.
 Bathymetric Information: David Evans and Associates, Inc.

0 50 100 Feet

- ▲ Actual collocated sediment grab
- ⊕ Target collocated sediment grab
- ⊙ Centroid of approximate set line/crayfish trap fishing area
- Actual 100ft fishing zone for sculpin and crayfish
- Approximate set line/crayfish trap fishing area

- ⊙ R3B target sculpin and collocated sediment
- ⊙ R3B target crayfish and collocated sediment

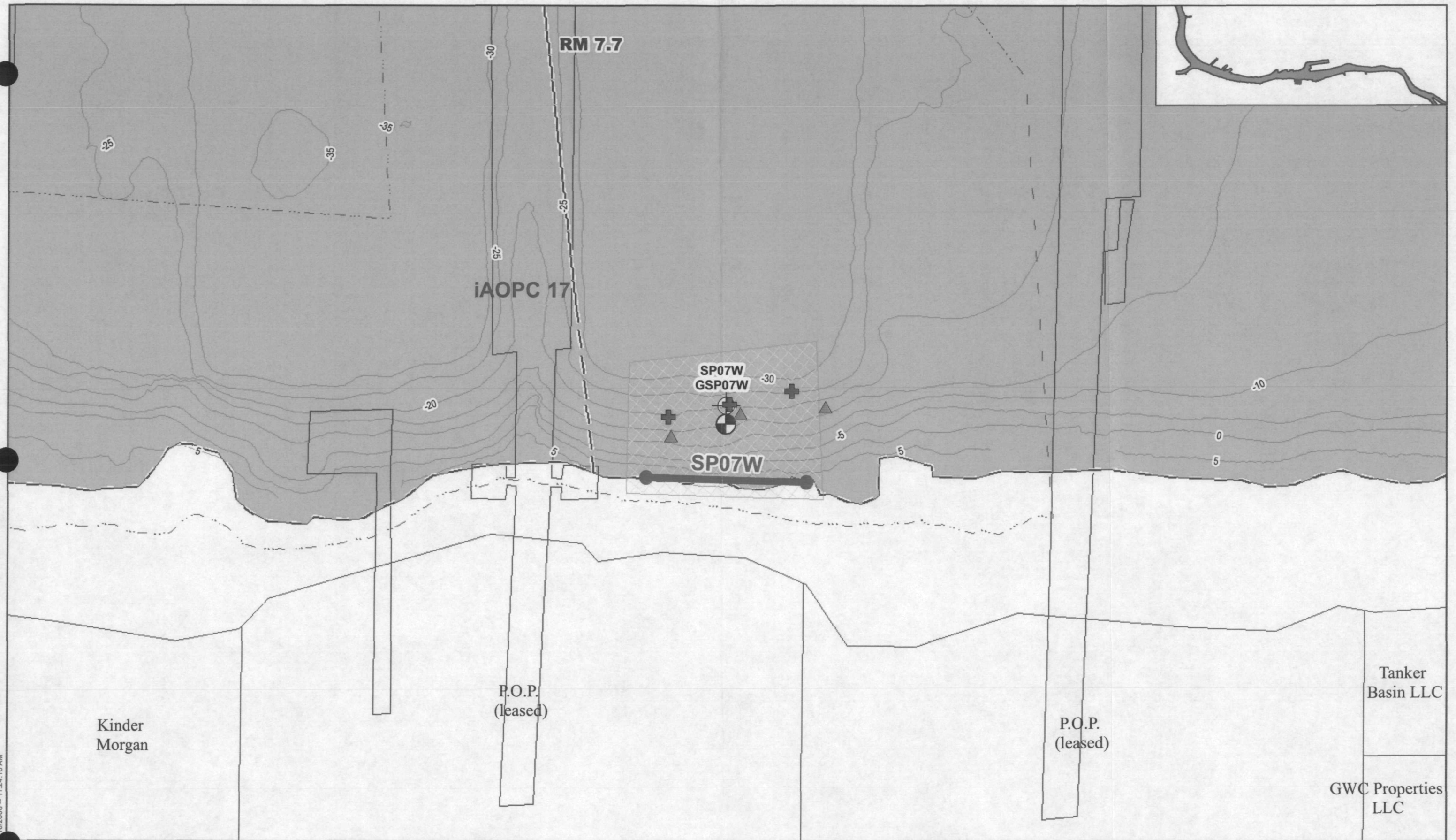
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 - ▬ Bridges
 - ⋯ Navigation Channel
 - ⋯ River Mile (tenths)
 - 5 foot Contour (NAVD88)

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Figure 3-1i
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
SP07E

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FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 Feet

- ▲ Actual collocated sediment grab
- ⊕ Target collocated sediment grab
- ⊙ Centroid of approximate set line/crayfish trap fishing area
- Actual 100ft fishing zone for sculpin and crayfish
- Approximate set line/crayfish trap fishing area

- ⊙ R3B target sculpin and collocated sediment
- ⊙ R3B target crayfish and collocated sediment

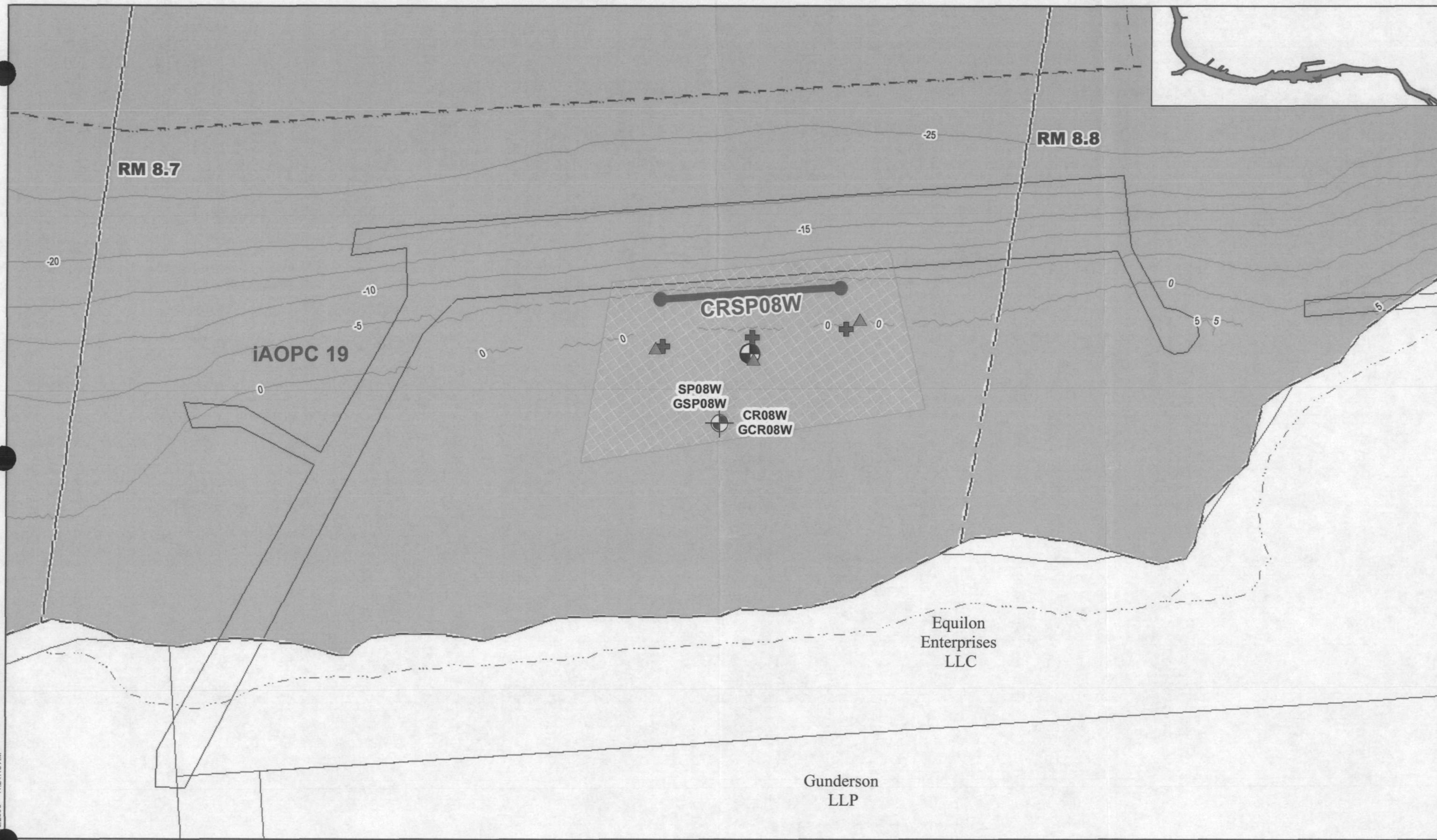
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 - ▬ Bridges
 - ▬ Navigation Channel
 - ▬ River Mile (tenths)
 - 5 foot Contour (NAVD88)

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Figure 3-1j
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
SP07W

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Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 Feet

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- Centroid of approximate set line/crayfish trap fishing area
- Actual 100ft fishing zone for sculpin and crayfish
- Approximate set line/crayfish trap fishing area

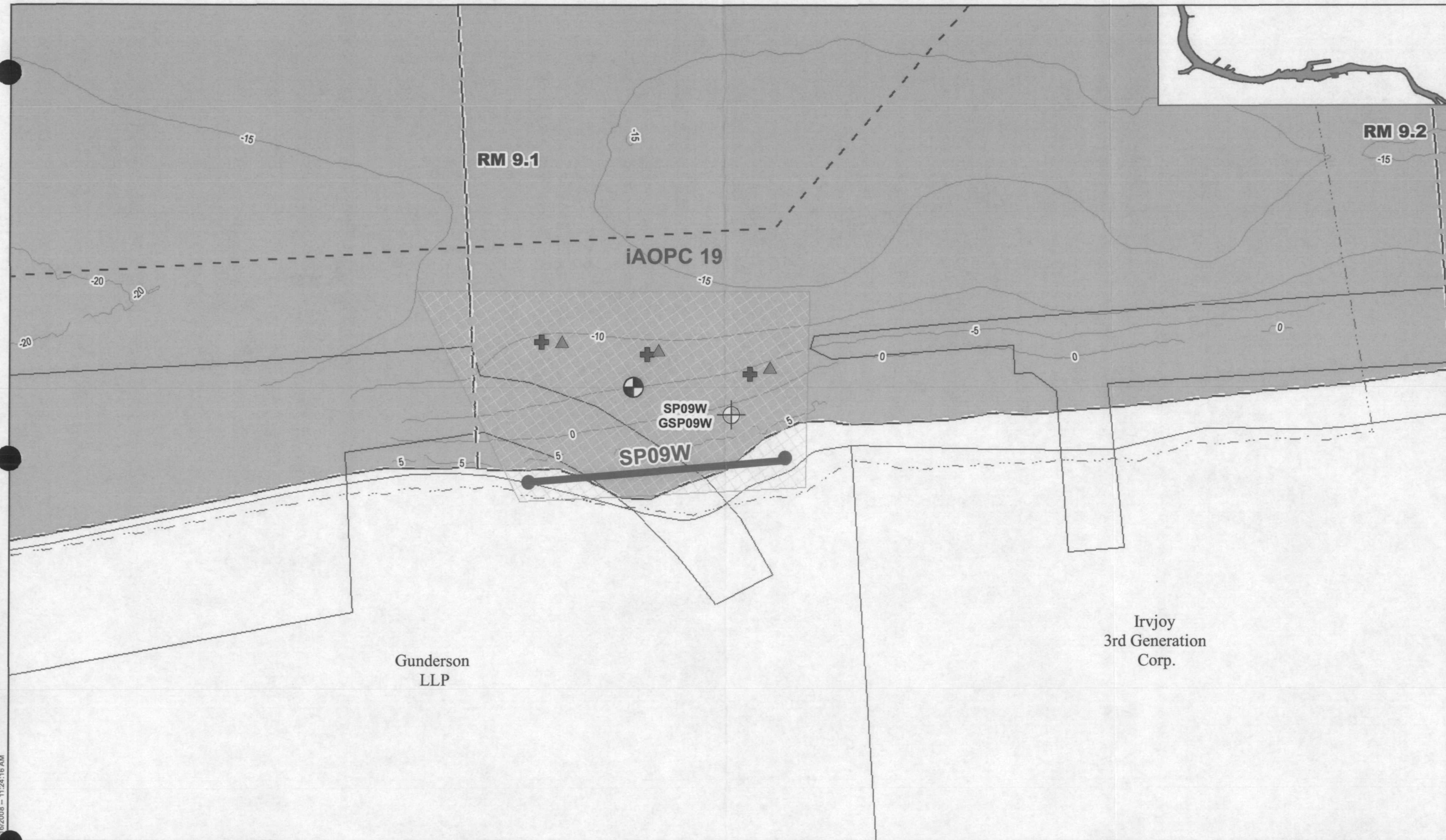
- ⊕ R3B target sculpin and collocated sediment
- ⊕ R3B target crayfish and collocated sediment

- Map Features:
- - - iAOPC_Boundary
 - ▬ Bridges
 - - - Navigation Channel
 - - - River Mile (tenths)
 - - - 5 foot Contour (NAVD88)

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Figure 3-11
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
CRSP08W

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Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 Feet

- ▲ Actual collocated sediment grab
- ⊕ Target collocated sediment grab
- ⊗ Centroid of approximate set line/crayfish trap fishing area
- Actual 100ft fishing zone for sculpin and crayfish
- ▨ Approximate set line/crayfish trap fishing area

- ⊗ R3B target sculpin and collocated sediment
- ⊗ R3B target crayfish and collocated sediment

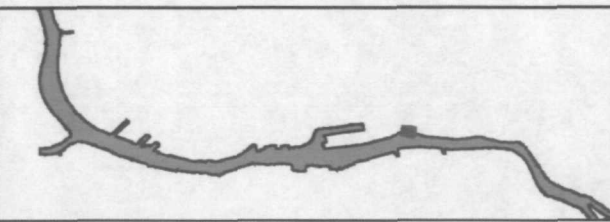
- Map Features:
- - - iAOPC_Boundary
 - ▬ Bridges
 - - - Navigation Channel
 - - - River Mile (tenths)
 - 5 foot Contour (NAVD88)

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Figure 3-1m
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
SP09W

Oregon
Washington
Railroad
& Navigation
Co.



City of
Portland

Ash Grove
Cement Co.

SP10E

iAOPC 25

SP10E
GSP10E

RM 10.0

FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 Feet

- ▲ Actual collocated sediment grab
- ⊕ Target collocated sediment grab
- ⊙ Centroid of approximate set line/crayfish trap fishing area
- Actual 100ft fishing zone for sculpin and crayfish
- Approximate set line/crayfish trap fishing area

- ⊙ R3B target sculpin and collocated sediment
- ⊙ R3B target crayfish and collocated sediment
- Map Features:
- iAOPC_Boundary
- ▬ Bridges
- ▬ Navigation Channel
- ▬ River Mile (tenths)
- ▬ 5 foot Contour (NAVD88)

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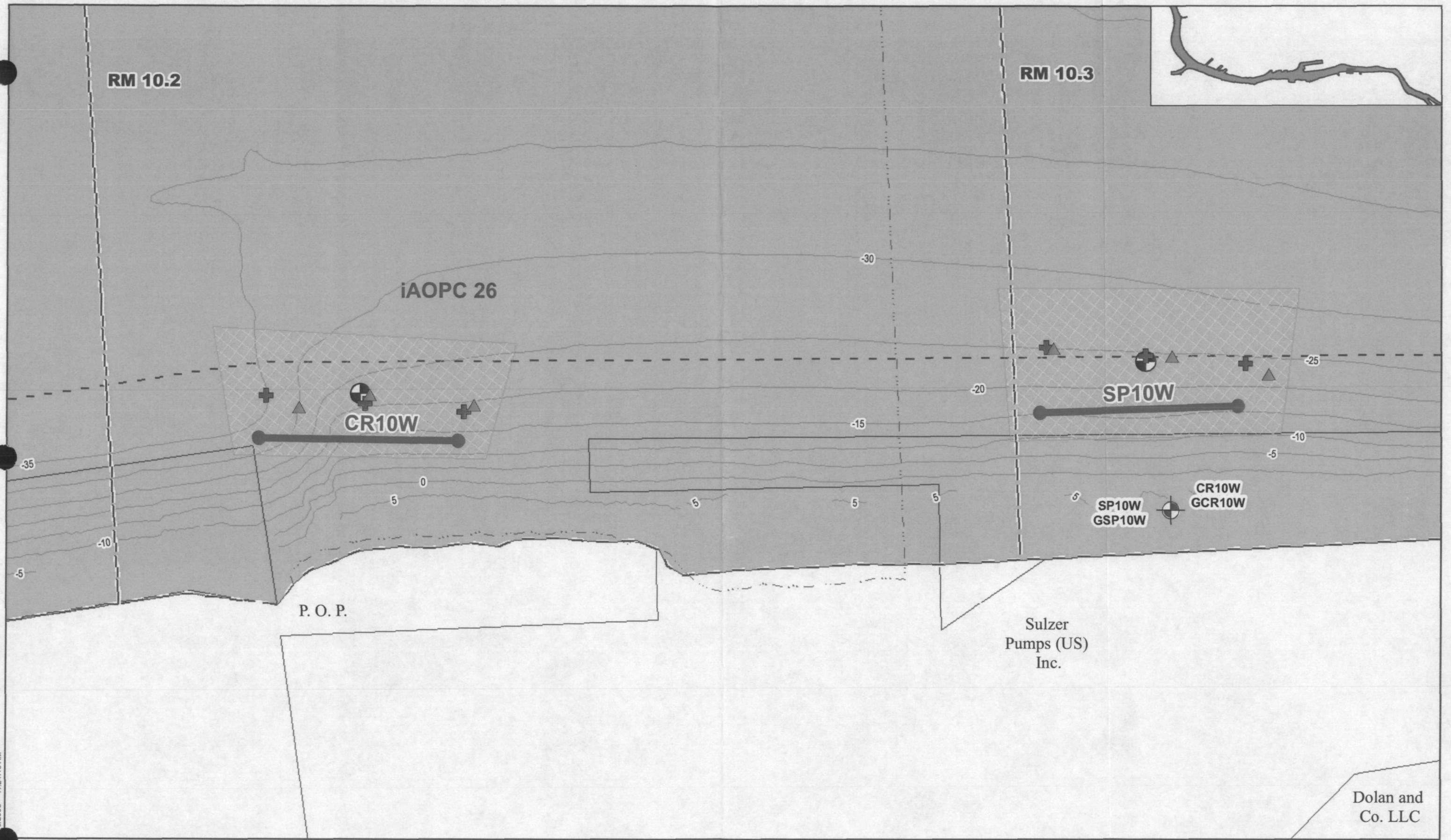
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Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
SP10E

Map Document: (P:\Projects\Portland_Harbor\LWG-Map-Projects\Round3_Tissue_B0101-58\Round3B_CollocSeds_A4_16_2008.mxd)
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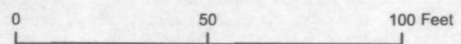
integral
consulting inc.

LWG
LOWER WILLAMETTE GROUP

Map Document: (P:\Projects\Portland_Harbor\LWG-Map-Projects\Round3_Tissue_B0101-58\Round3B_CollocSeds_R4_16_2008.mxd)
11/16/2008 11:24:16 AM



FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.
Bathymetric Information: David Evans and Associates, Inc.



- ▲ Actual collocated sediment grab
- ⊕ Target collocated sediment grab
- Centroid of approximate set line/crayfish trap fishing area
- Actual 100ft fishing zone for sculpin and crayfish
- Approximate set line/crayfish trap fishing area

- ⊕ R3B target sculpin and collocated sediment
- ⊕ R3B target crayfish and collocated sediment

- Map Features:
- iAOPC Boundary
 - Bridges
 - Navigation Channel
 - River Mile (tenths)
 - 5 foot Contour (NAVD88)

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Figure 3-1o
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
CR10W and SP10W

Dolan and
Co. LLC

Map Document: (P:\Projects\Portland_Harbor\WLG-Map-Projects\Round3_Tissue_B0101-58\CR3B_CollocSed.mxd)
6/2008 - 11:24:16 AM

FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

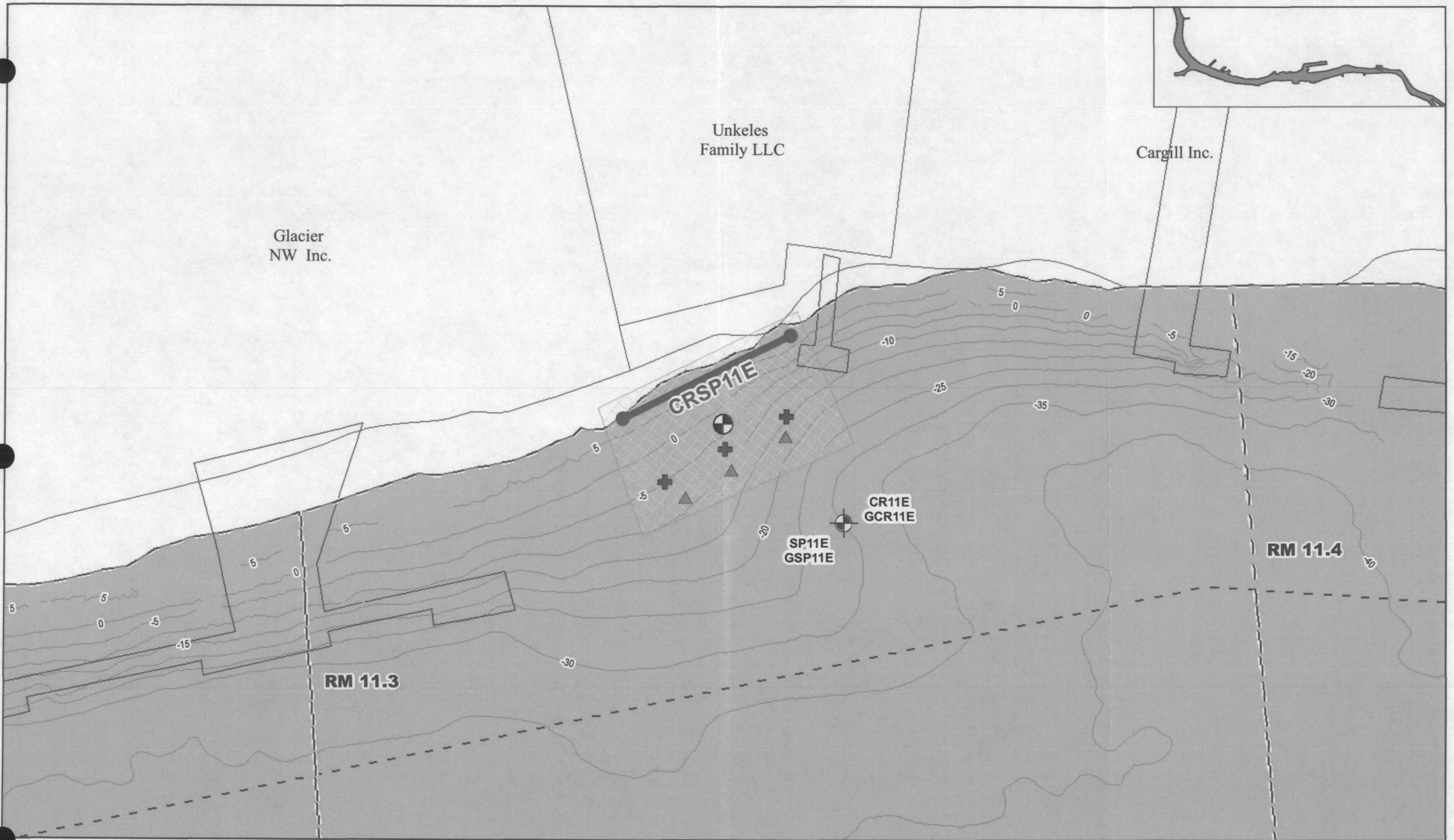
0 50 100 Feet

- ▲ Actual collocated sediment grab
- ⊕ Target collocated sediment grab
- ⊙ Centroid of approximate set line/crayfish trap fishing area
- Actual 100ft fishing zone for sculpin and crayfish
- Approximate set line/crayfish trap fishing area

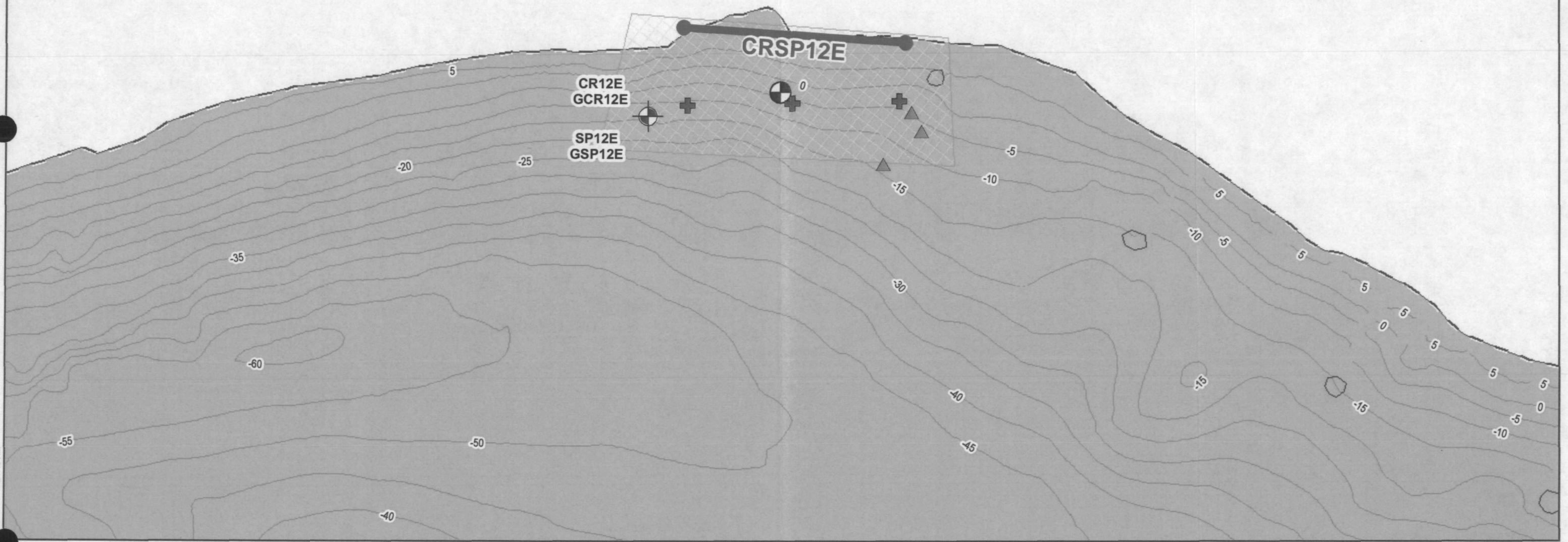
- ⊙ R3B target sculpin and collocated sediment
- ⊙ R3B target crayfish and collocated sediment
- Map Features:**
 - ⋯ IAOPC Boundary
 - ▬ Bridges
 - ▬ Navigation Channel
 - ▬ River Mile (tenths)
 - 5 foot Contour (NAVD88)

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Figure 3-1p
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
CRSP11E



Map Document: (P:\Projects\Portland_Harbor\WLG-Map-Projects\Round3_Tissue_B0101-58\CR3B_CollocSeds.dwg, 16_2008.mxd)
16/2008 - 11:24:16 AM



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consulting inc.

LWG
LOWER WILLAMETTE GROUP

FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 Feet

- Actual collocated sediment grab
- Target collocated sediment grab
- Centroid of approximate set line/crayfish trap fishing area
- Actual 100ft fishing zone for sculpin and crayfish
- Approximate set line/crayfish trap fishing area

- R3B target sculpin and collocated sediment
- R3B target crayfish and collocated sediment

- Map Features:
- iAOPC_Boundary
 - Bridges
 - Navigation Channel
 - River Mile (tenths)
 - 5 foot Contour (NAVD88)

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Figure 3-1q
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
CRSP12E

Map Document: (P:\Projects\Portland_Harbor\WLG-Map-Projects\Round3_Tissue_B0101-58\B3B_CollocSeds_01_16_2008.mxd)
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FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 Feet

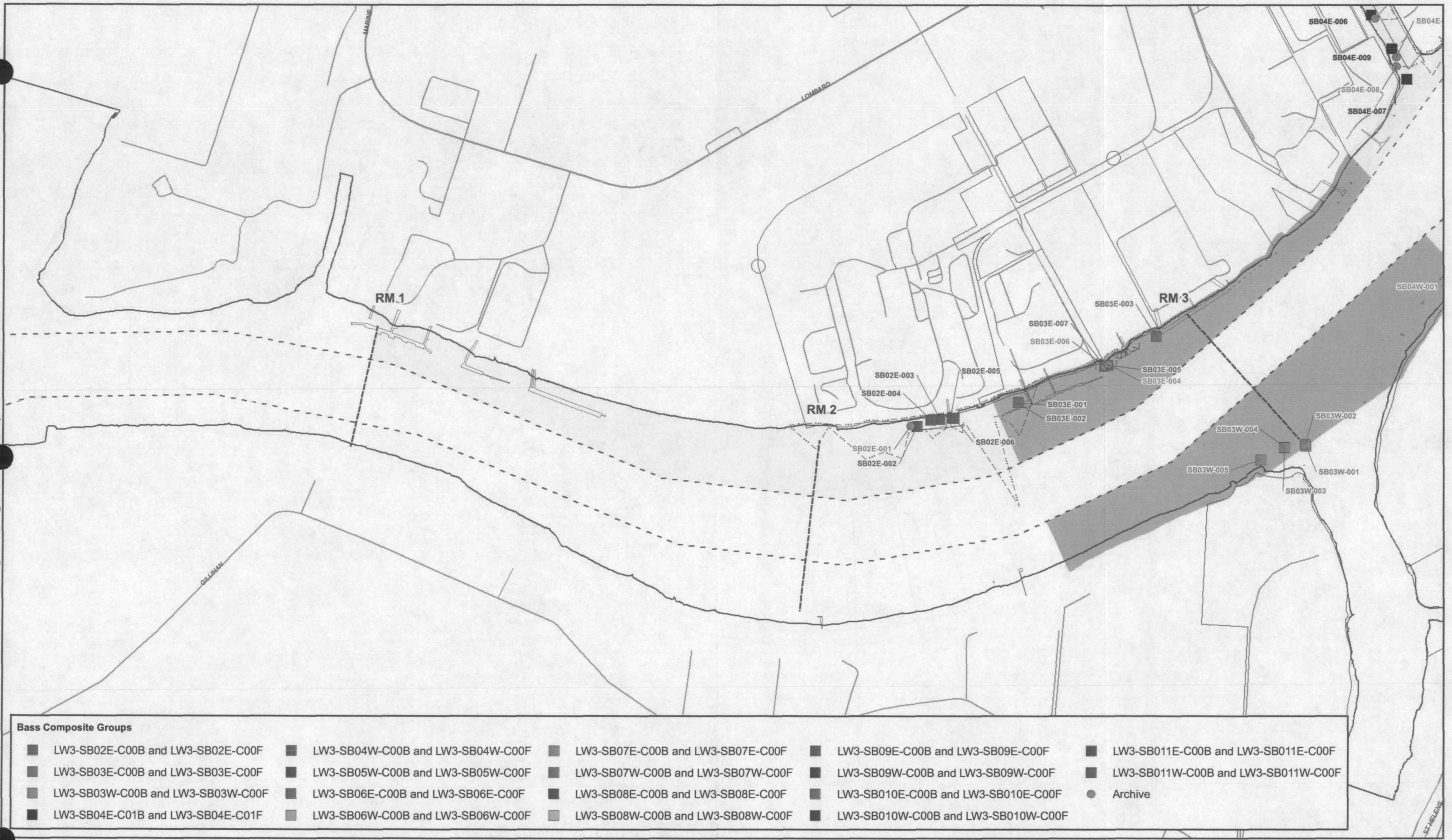
- ▲ Actual collocated sediment grab
- ⊕ Target collocated sediment grab
- ⊗ Centroid of approximate set line/crayfish trap fishing area
- ▬ Actual 100ft fishing zone for sculpin and crayfish
- ▬ Approximate set line/crayfish trap fishing area

- ⊗ R3B target sculpin and collocated sediment
- ⊗ R3B target crayfish and collocated sediment

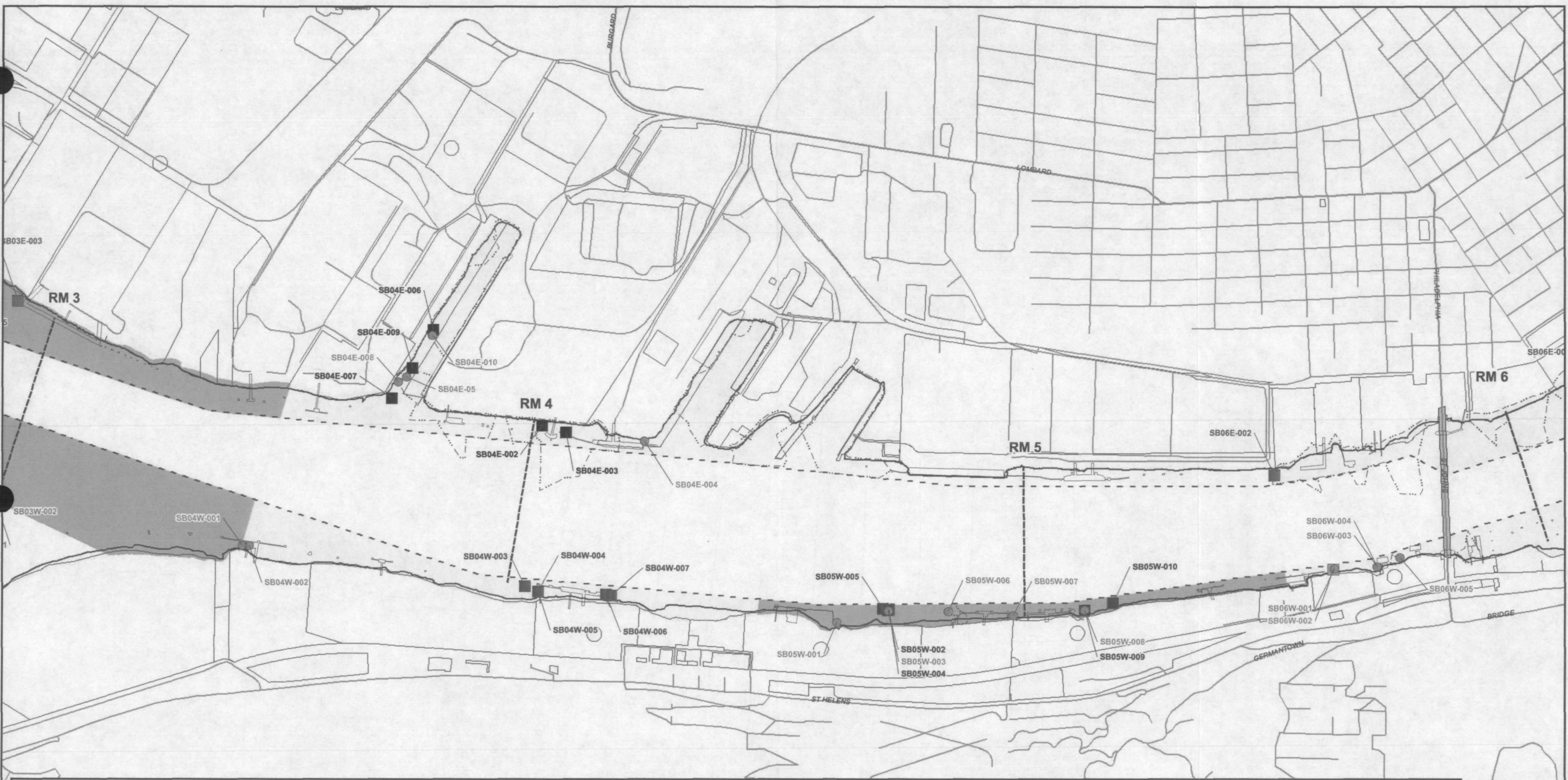
- Map Features:
- ⋯ iAOPC_Boundary
 - ▬ Bridges
 - ▬ Navigation Channel
 - ▬ River Mile (tenths)
 - 5 foot Contour (NAVD88)

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Figure 3-1r
Portland Harbor RI/FS
Round 3B Actual Sculpin and
Crayfish Tissue and Collocated
Sediment Sample Locations
CR12W and SP12W-ALT

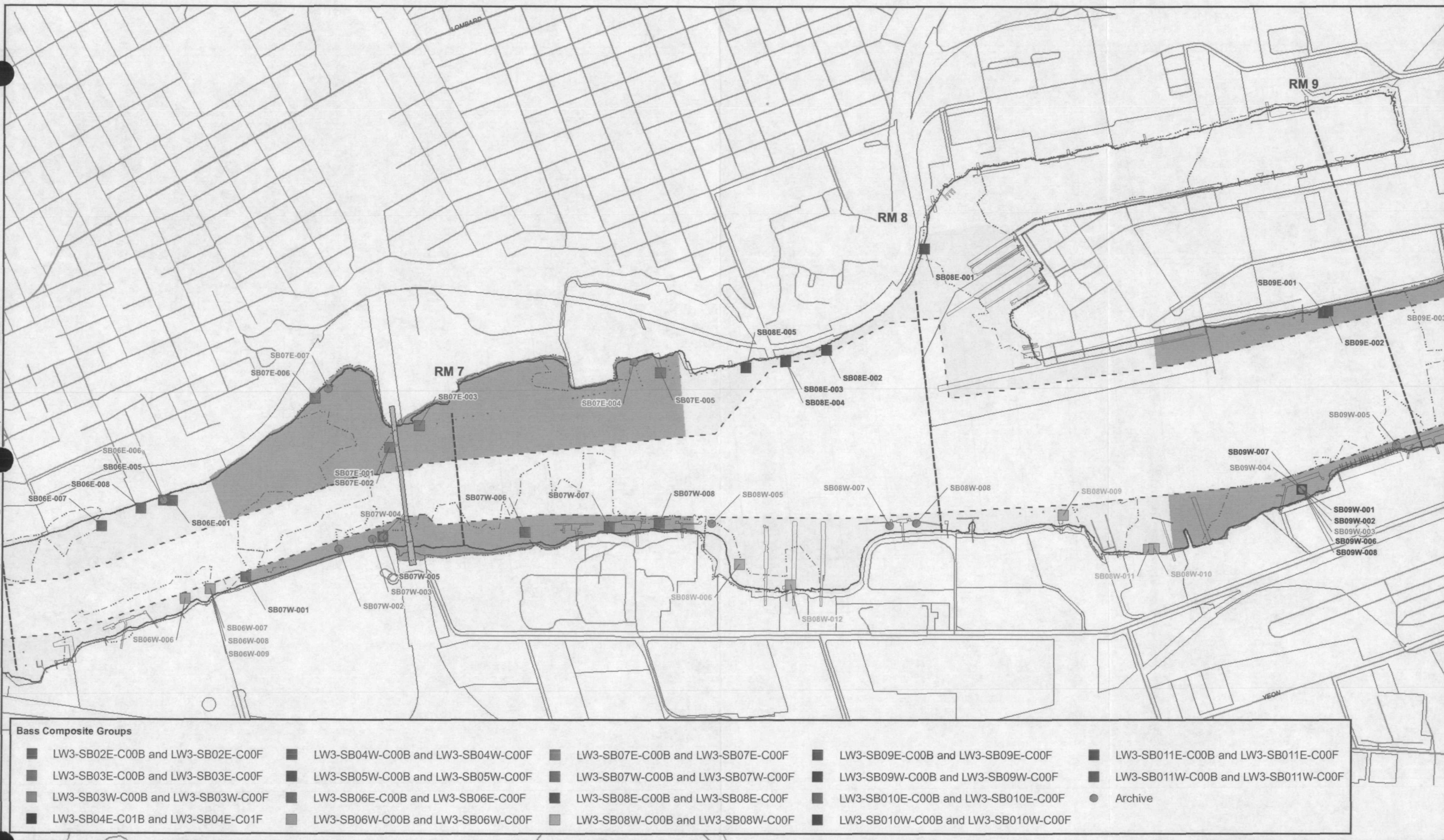


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Bass Composite Groups					
■ LW3-SB02E-C00B and LW3-SB02E-C00F	■ LW3-SB04W-C00B and LW3-SB04W-C00F	■ LW3-SB07E-C00B and LW3-SB07E-C00F	■ LW3-SB09E-C00B and LW3-SB09E-C00F	■ LW3-SB011E-C00B and LW3-SB011E-C00F	
■ LW3-SB03E-C00B and LW3-SB03E-C00F	■ LW3-SB05W-C00B and LW3-SB05W-C00F	■ LW3-SB07W-C00B and LW3-SB07W-C00F	■ LW3-SB09W-C00B and LW3-SB09W-C00F	■ LW3-SB011W-C00B and LW3-SB011W-C00F	
■ LW3-SB03W-C00B and LW3-SB03W-C00F	■ LW3-SB06E-C00B and LW3-SB06E-C00F	■ LW3-SB08E-C00B and LW3-SB08E-C00F	■ LW3-SB010E-C00B and LW3-SB010E-C00F	● Archive	
■ LW3-SB04E-C01B and LW3-SB04E-C01F	■ LW3-SB06W-C00B and LW3-SB06W-C00F	■ LW3-SB08W-C00B and LW3-SB08W-C00F	■ LW3-SB010W-C00B and LW3-SB010W-C00F		

Map Document: (O:\Projects\Portland_Harbor\LWG-Map-Projects\Round3_Tissue_B0101-58\B3B_BassActual_C.mxd) TWC -- 10/25/2007 -- 2:47:34 PM



integral
consulting inc.

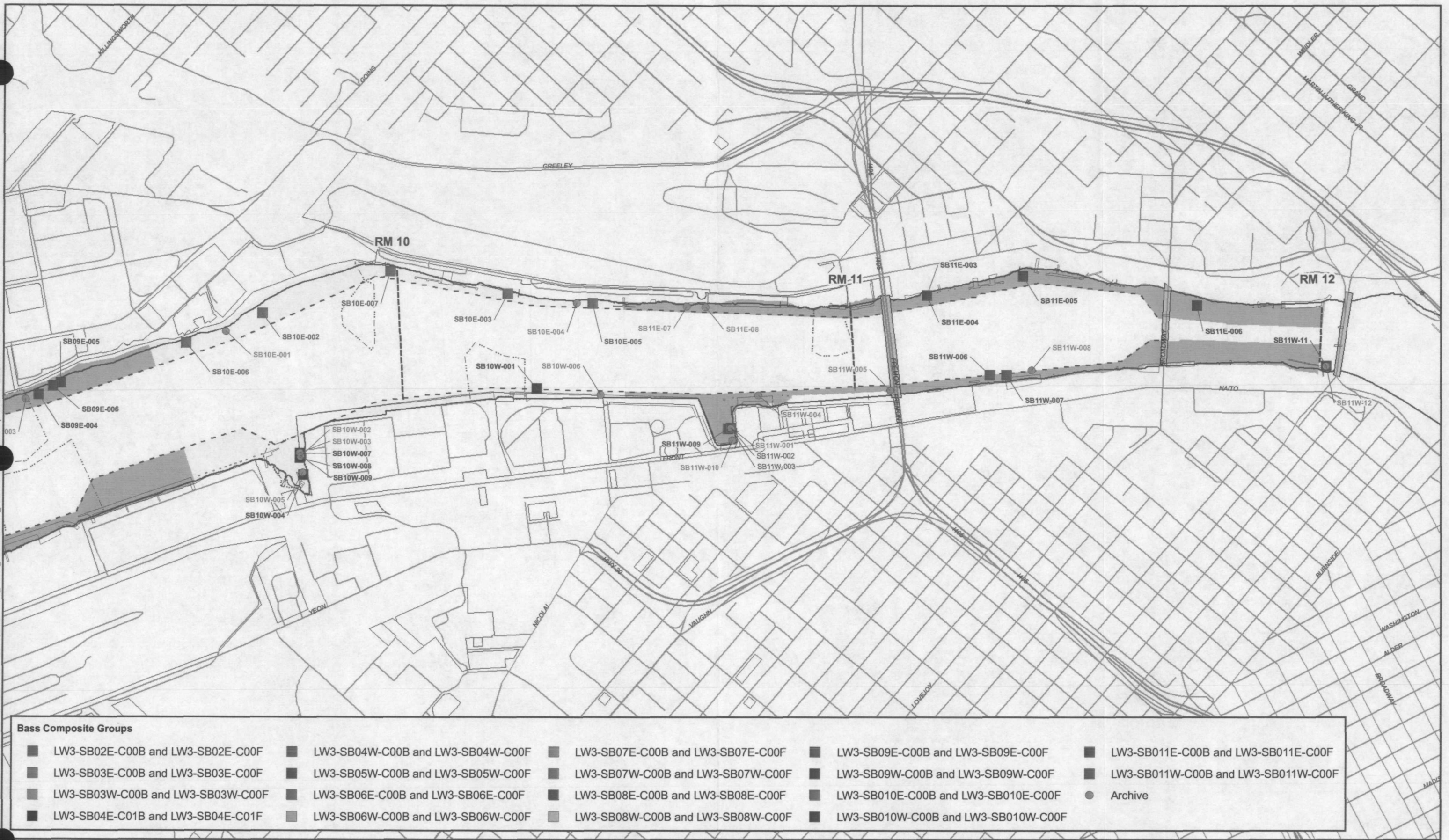
LWG
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Figure 3-2c
Portland Harbor RI/FS
R3B Actual Smallmouth Bass Sample Locations
RM 6 to 9

Map Document: (O:\Projects\Portland_Harbor\LWG-Map-Projects\Round3_Tissue_B0101-58\B3B_BassActual_C.mxd) TWC -- 10/25/2007 -- 2:47:34 PM



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FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers.
Bathymetric Information: David Evans and Associates, Inc.

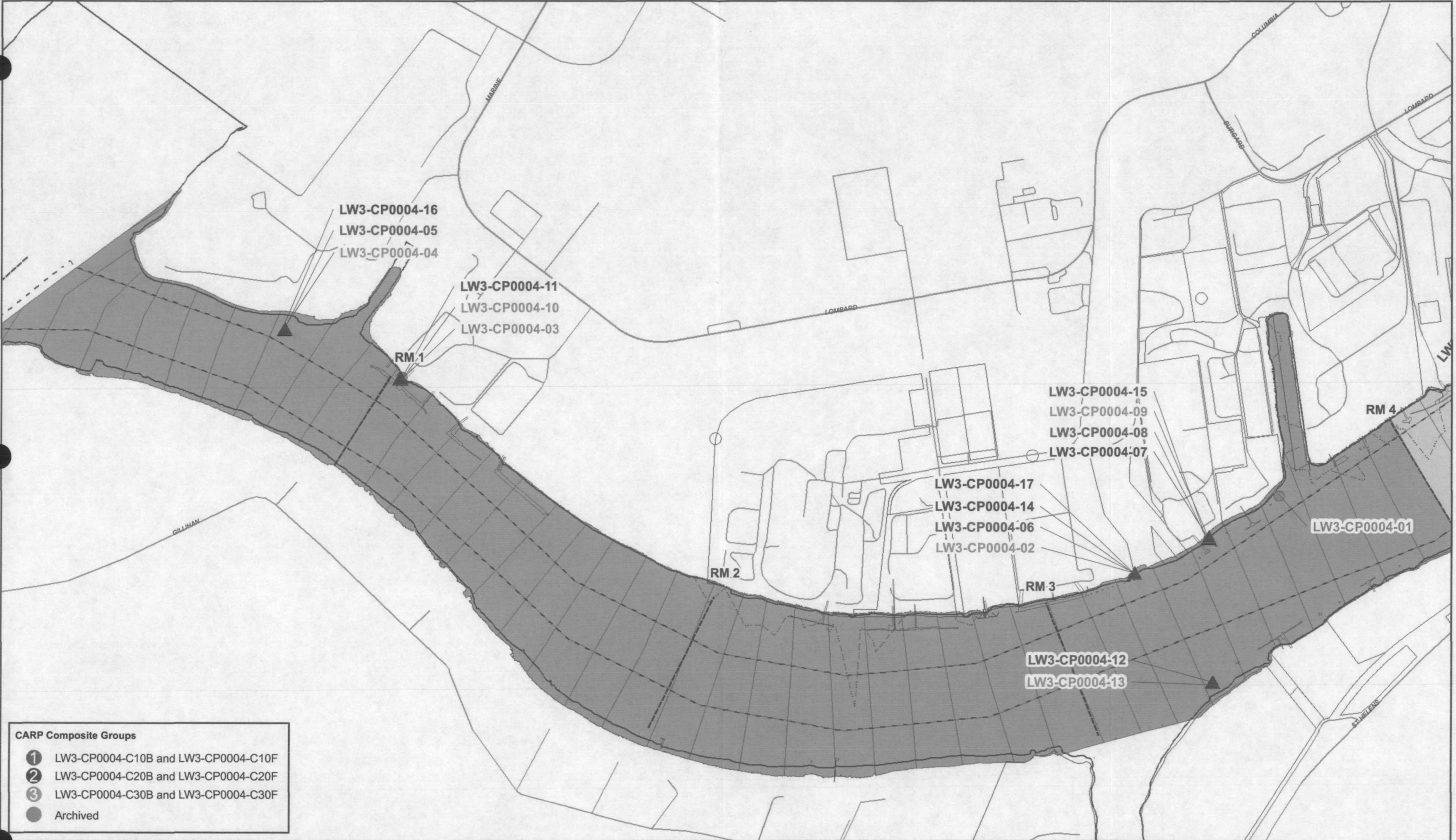
0 200 400 600 800 1,000 Feet

LWG
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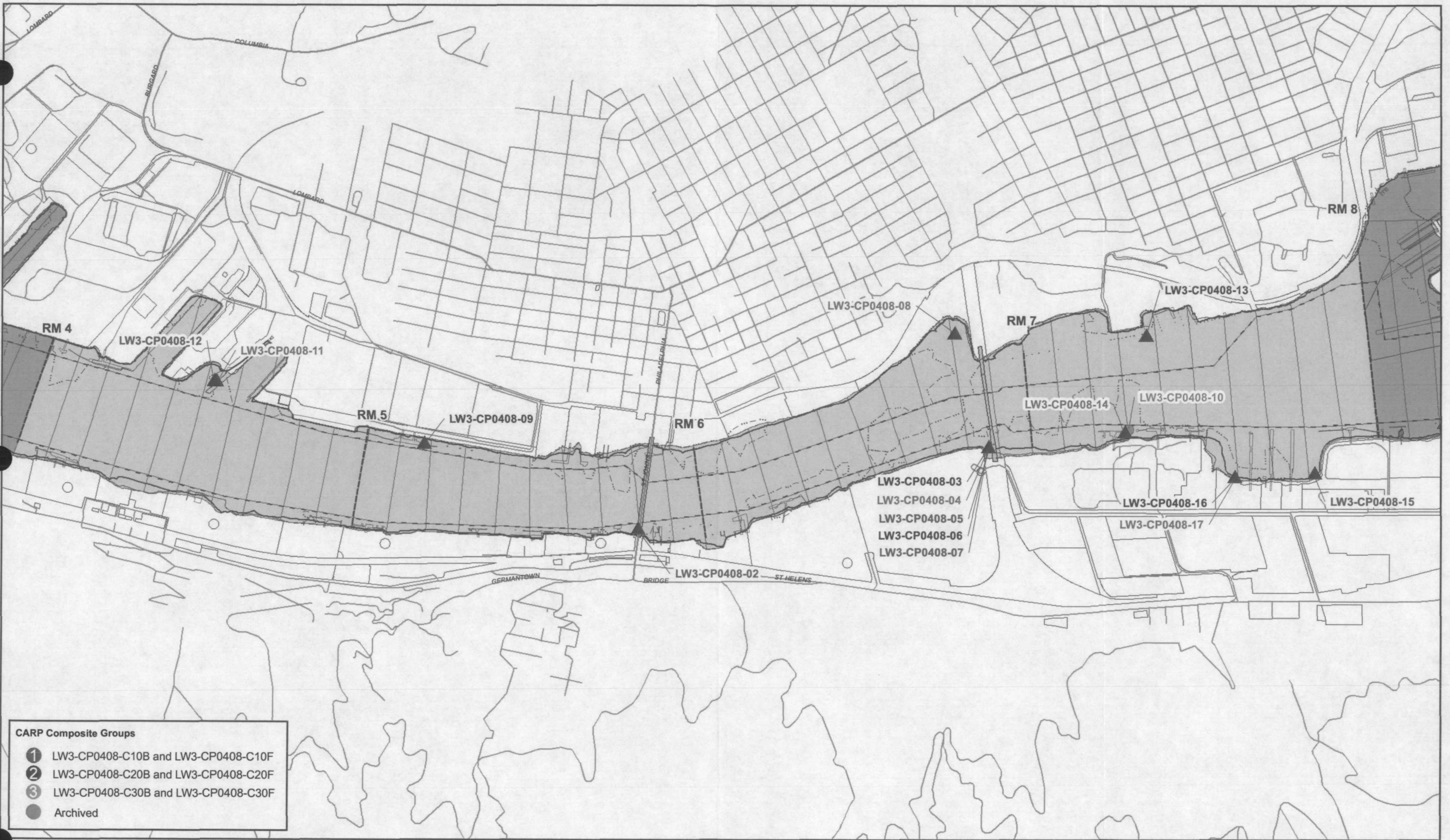
Figure 3-2d
Portland Harbor RI/FS
R3B Actual Smallmouth Bass Sample Locations
RM 9 to 12

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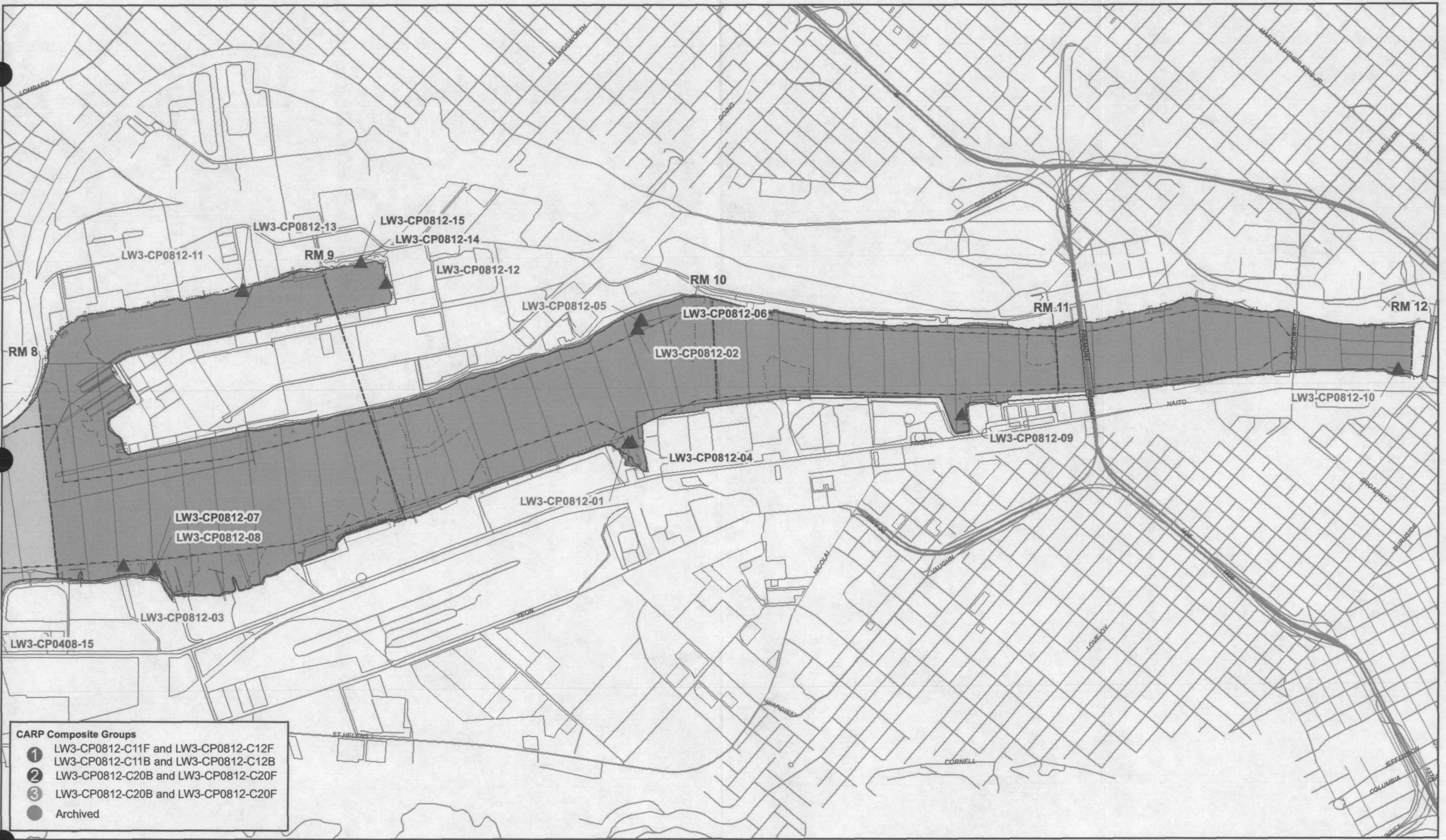


- CARP Composite Groups**
- ① LW3-CP0004-C10B and LW3-CP0004-C10F
 - ② LW3-CP0004-C20B and LW3-CP0004-C20F
 - ③ LW3-CP0004-C30B and LW3-CP0004-C30F
 - Archived

Figure 3-3a
Portland Harbor RI/FS
R3B Actual Carp Sampling Locations
RM 0 to 4



Map Document: (O:\Projects\Portland_Harbor\LWG-Map-Projects\Round3_Tissue_B0101-58\R3B_CarpActual.dxd) TWC - 1/12/2008 - 11:57:54 AM



CARP Composite Groups

- ① LW3-CP0812-C11F and LW3-CP0812-C12F
LW3-CP0812-C11B and LW3-CP0812-C12B
- ② LW3-CP0812-C20B and LW3-CP0812-C20F
- ③ LW3-CP0812-C20B and LW3-CP0812-C20F
- Archived

Map Features:

- ▲ Actual Carp Location (used in composite)
- Archived Actual Location
- IAOPC_Boundary
- ▬ Bridges
- - - Navigation Channel

FISH (Carp)

- CP0004 (RM 0-4)
- CP0408 (RM 4-8)
- CP0812 (RM 8-12)

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Figure 3-3c
Portland Harbor RI/FS
R3B Actual Carp Sampling Locations
RM 8 to 12

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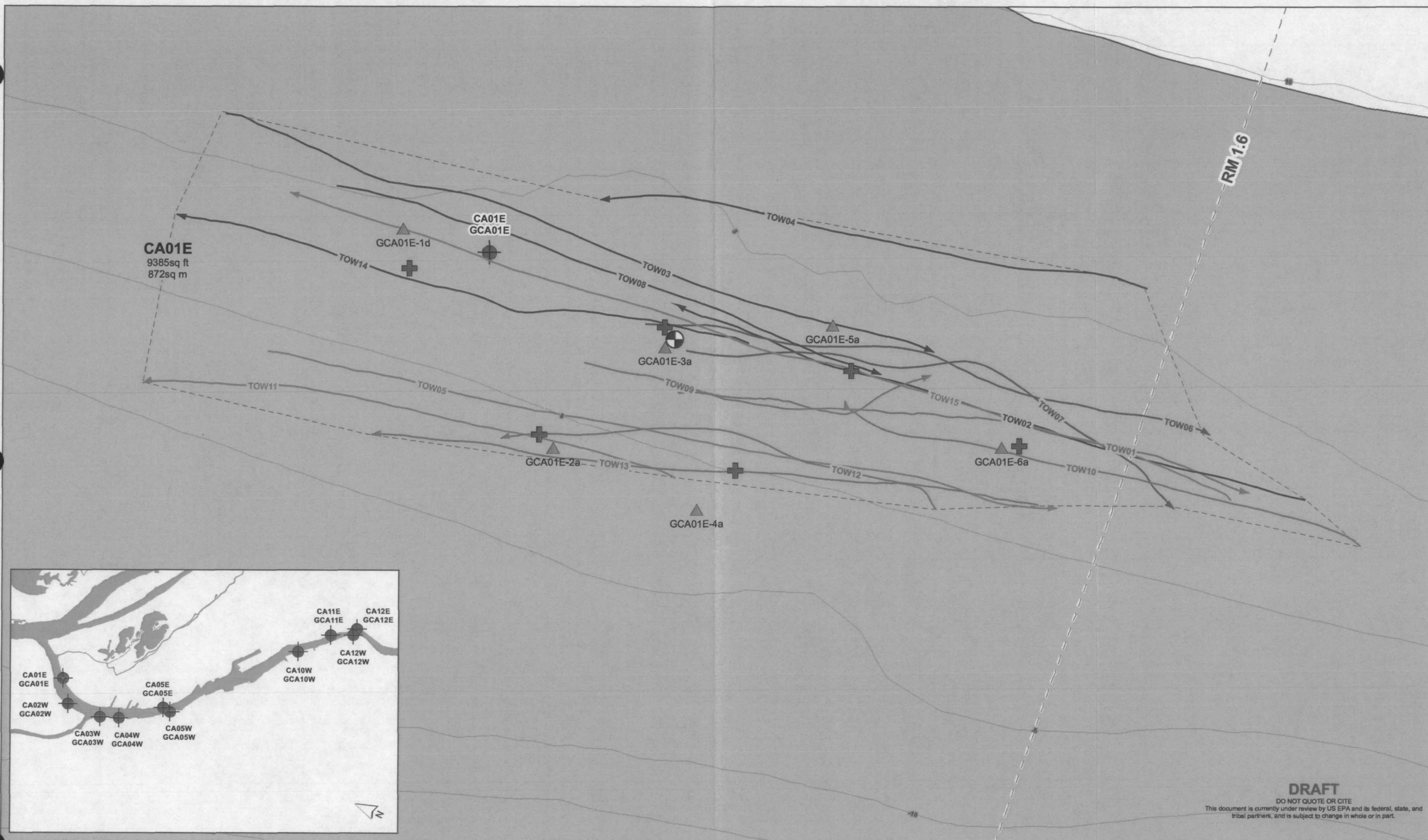
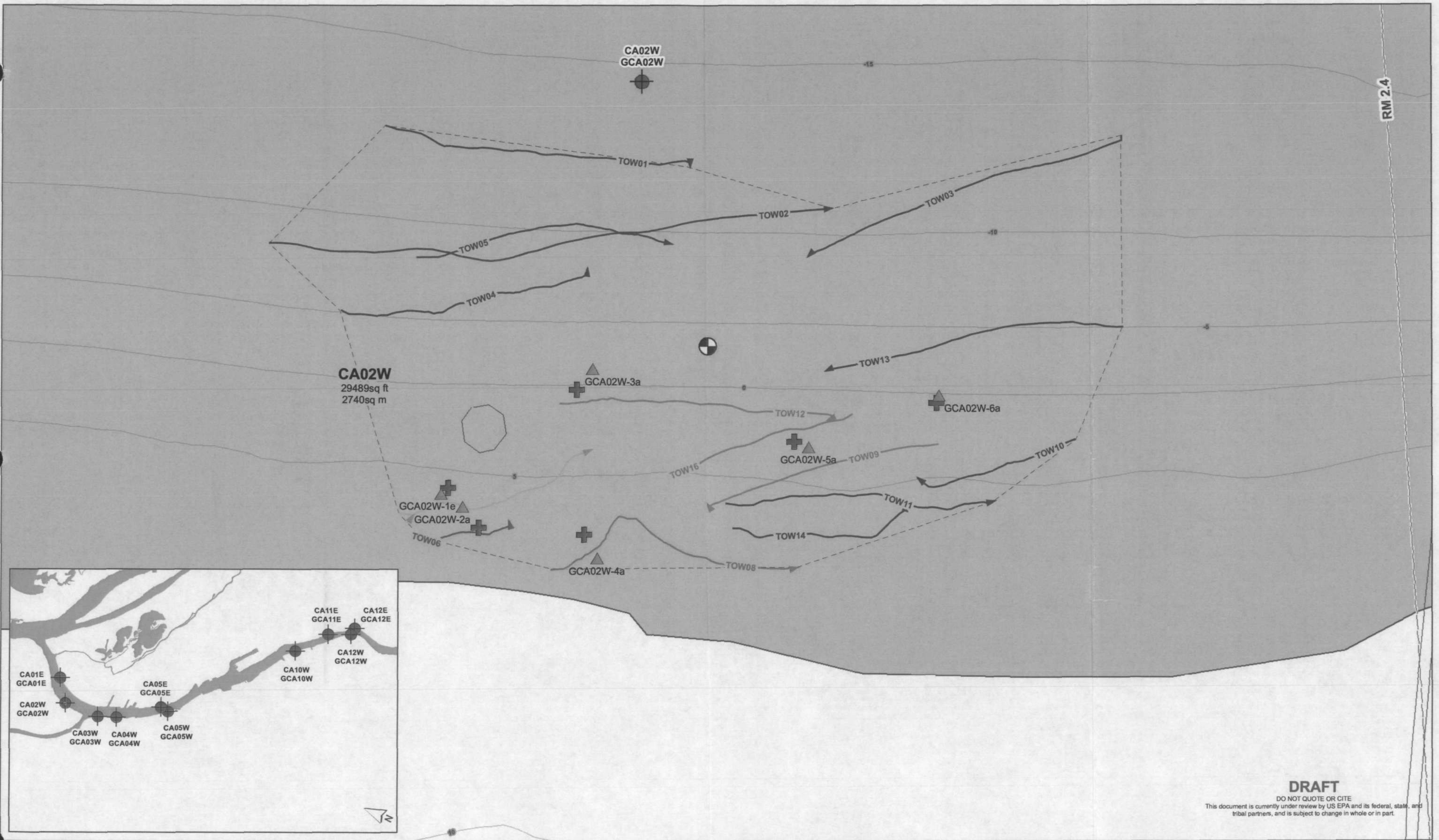
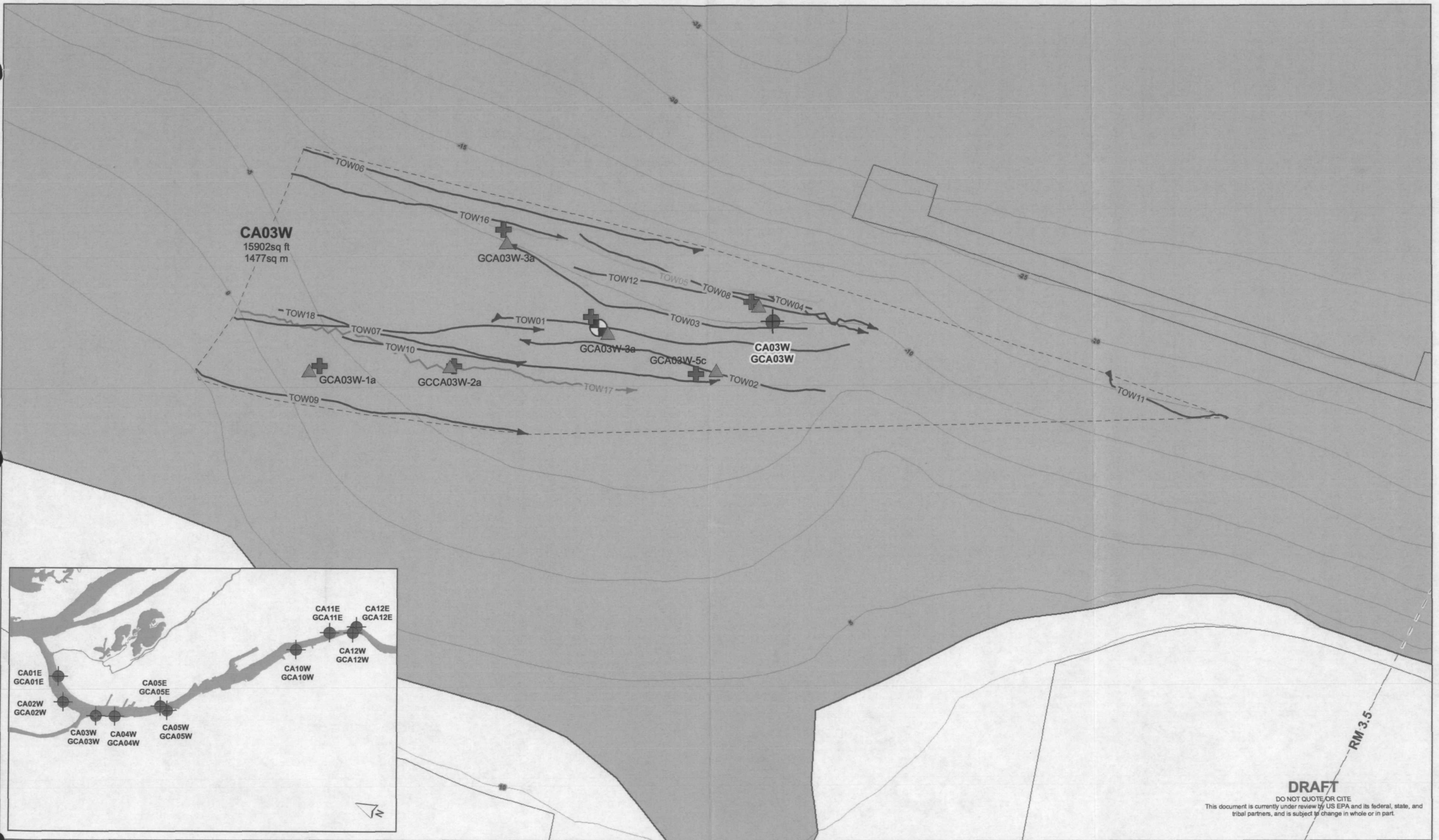


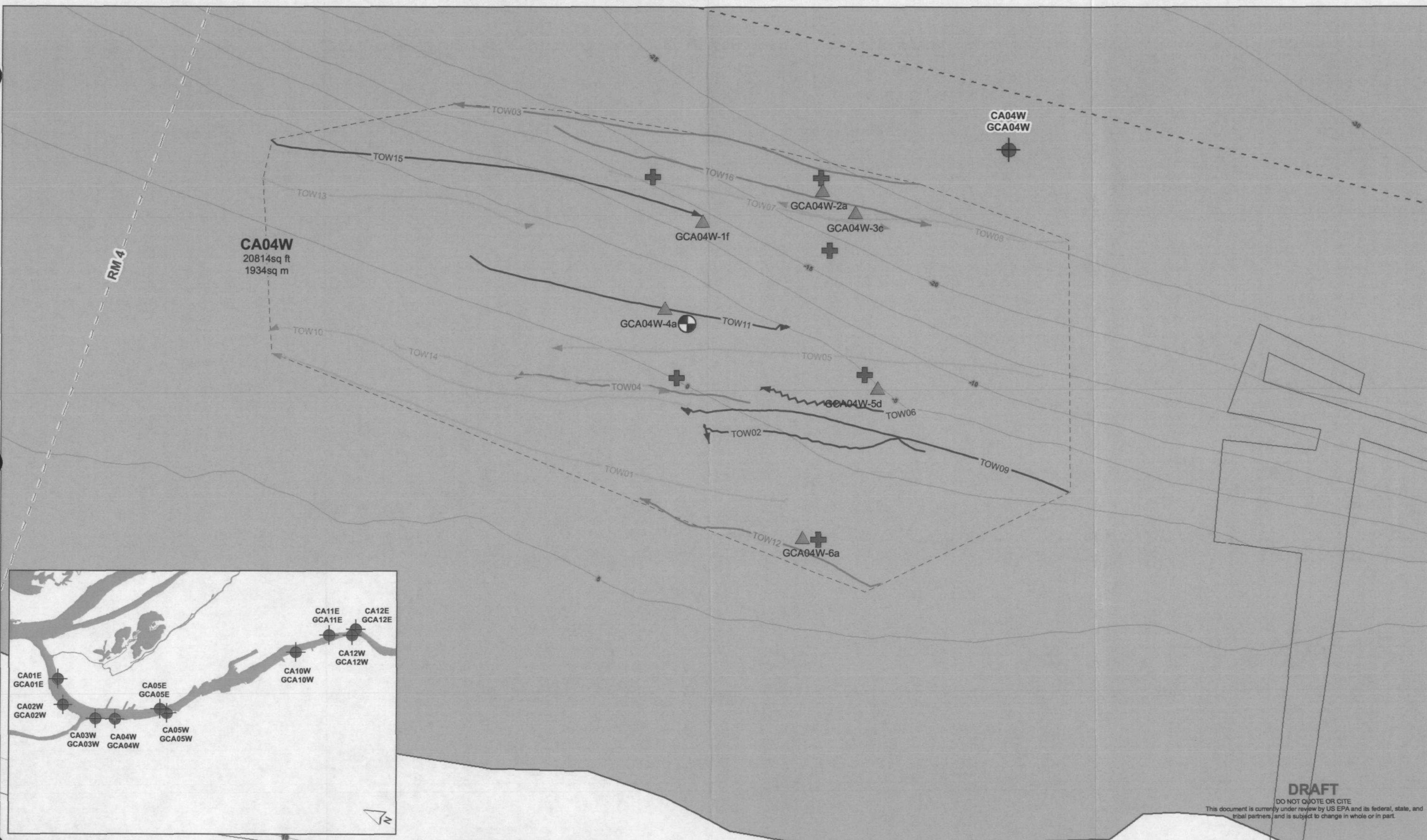
Figure 3-4a
Portland Harbor RI/FS
R3B Actual Clam Tissue and Collocated Sediment Sample Locations
Station: CA01E



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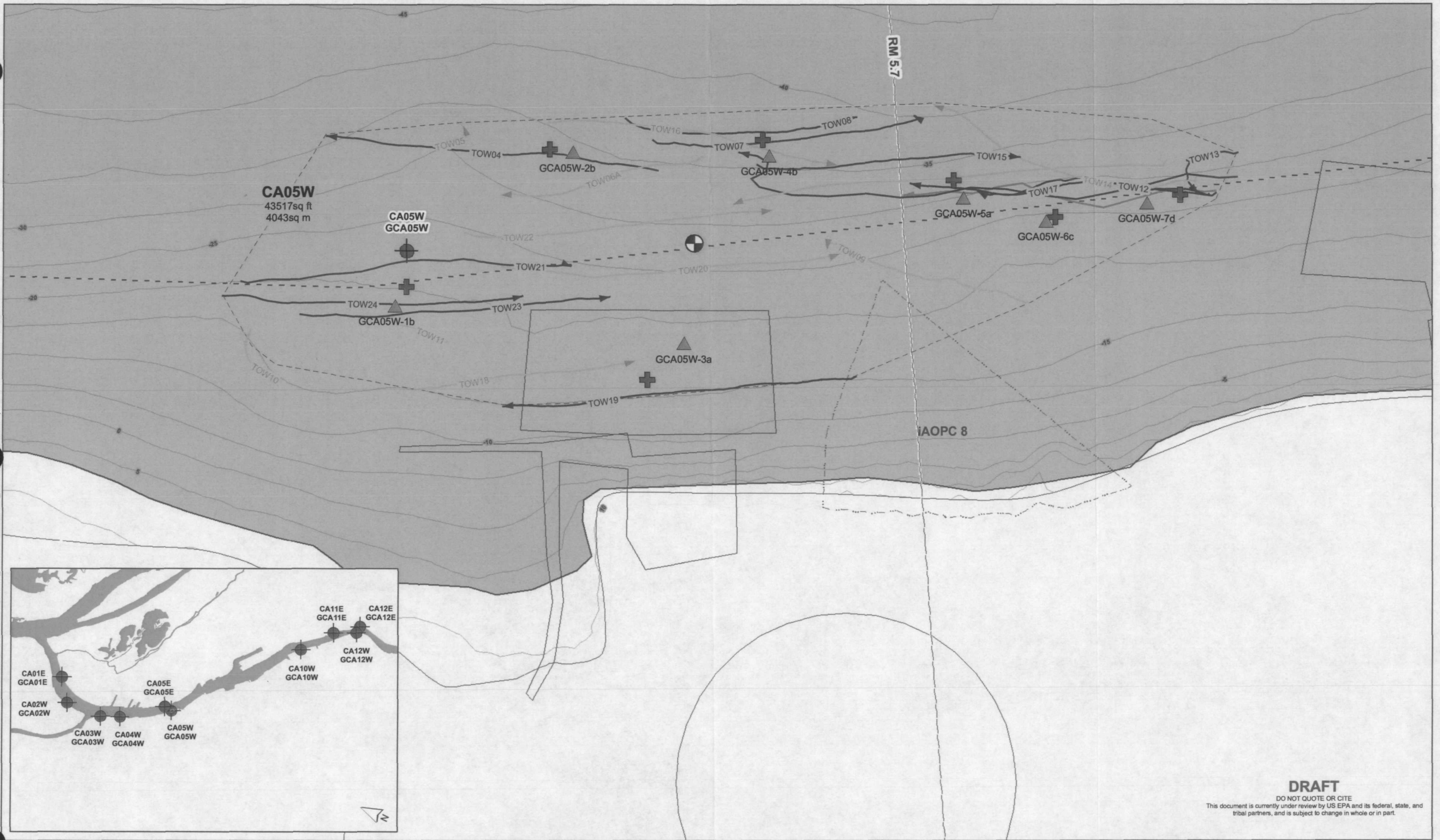
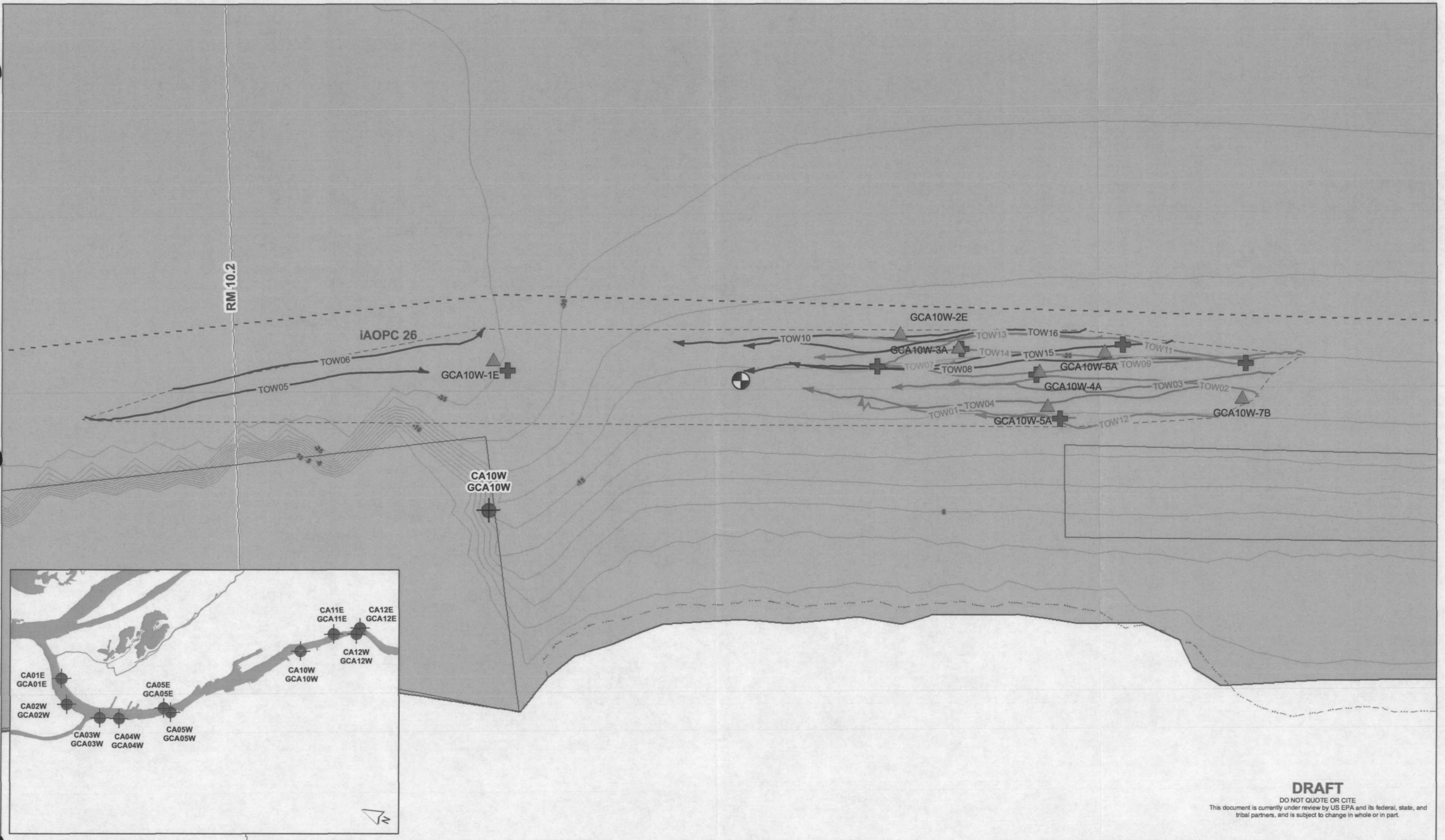


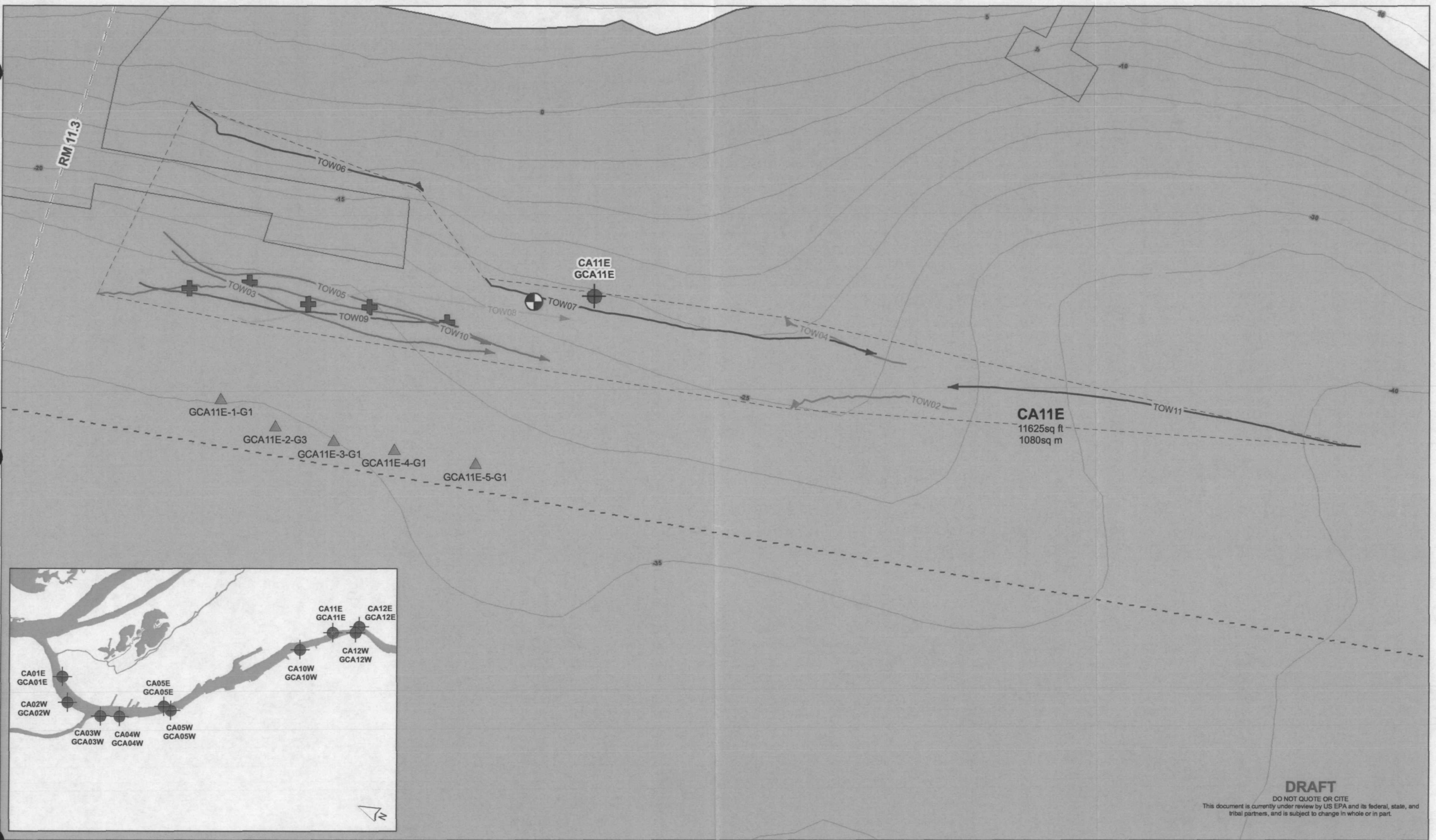
Figure 3-4f
Portland Harbor RI/FS
R3B Actual Clam Tissue and Collocated Sediment Sample Locations
Station: CA05W

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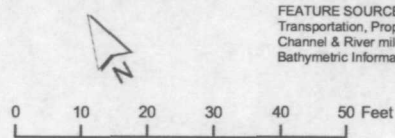
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FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

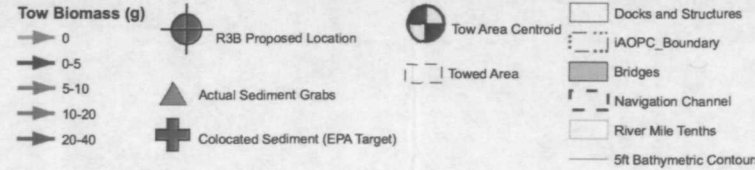
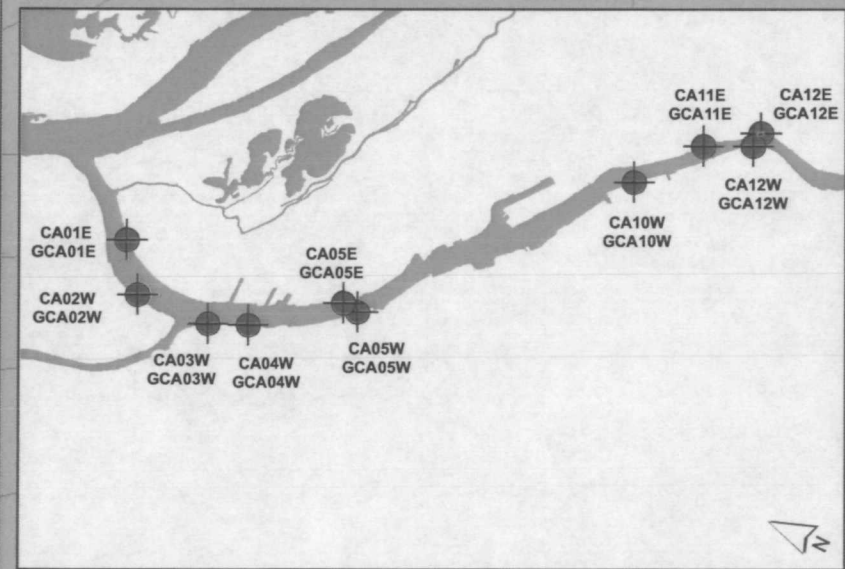


Figure 3-4h
Portland Harbor RI/FS
R3B Actual Clam Tissue and Collocated Sediment Sample Locations
Station: CA11E

p Document: (O:\Projects\Portland_Harbor\LWG-Map-Projects\Benthic2007_BenthicMDXs\Station_CA12E_115.mxd) TWC -- 11/16/2007 -- 2:32:43 PM



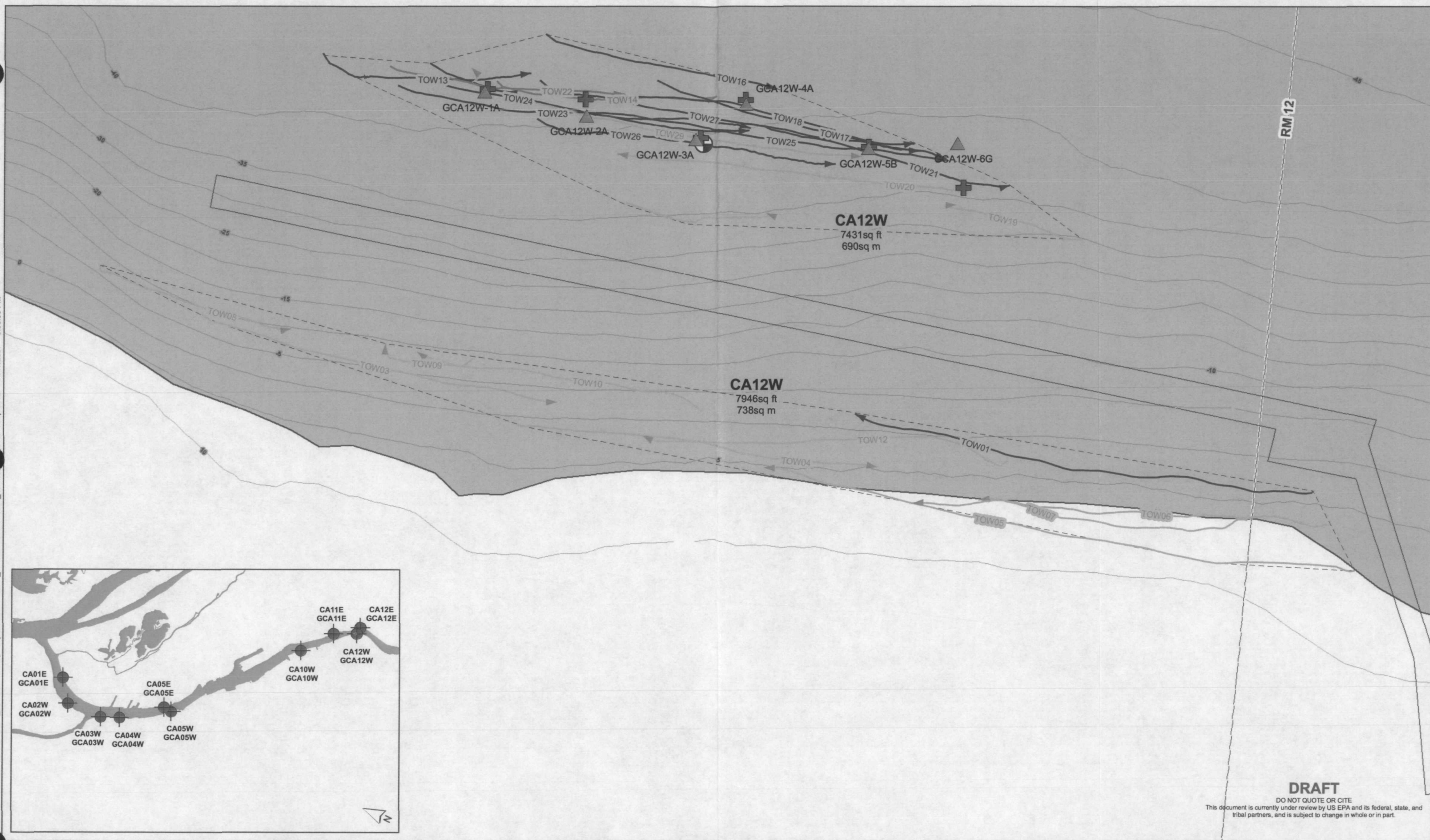
FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 10 20 30 40 50 Feet

- | | | | |
|------------------------|--|--|--|
| Tow Biomass (g) | | | |
| → 0 | | | |
| → 0-5 | | | |
| → 5-10 | | | |
| → 10-20 | | | |
| → 20-40 | | | |
| | | | |
| | | | |

Figure 3-4i
Portland Harbor RI/FS
R3B Actual Clam Tissue and Collocated Sediment Sample Locations
Station: CA12E

p Document: O:\Projects\Portland_Harbor\LWG_Map_Projects\Benthic2007_BenthicMDXs\Station_CA12W_1116.mxd TWC -- 11/17/2007 -- 3:38:30 PM



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Figure 3-4j
Portland Harbor RI/FS
R3B Actual Clam Tissue and Collocated Sediment Sample Locations
Station: CA12W

Tables

Table 2-1. Chronology of Sample Collection Efforts.

Date	Activity
8/7/07	Reconnaissance trip with EPA
8/27-28/2007	Crayfish trapping, Set line ^a
8/29 - 8/31/07	Crayfish trapping, Set line, Backpack electrofishing
9/4 - 9/7/07	Crayfish trapping, Set line, Backpack electrofishing, Angling
9/10 - 9/13/07	Crayfish trapping, Set line, Backpack electrofishing, Angling
9/14 - 9/21/07	Set line, Backpack electrofishing, Angling
9/24/07	Set line, Backpack electrofishing, Angling
9/25/07	Set line, Backpack electrofishing
9/26 - 9/27/07	Set line, Backpack electrofishing, Angling
9/28/07	Set line, Backpack electrofishing
10/4 - 10/5/07	Acquisition of GPS coordinates for actual sculpin and crayfish sampling stations
10/15 - 10/18/07	Collection of collocated sediment samples at sculpin and crayfish stations
11/12 - 11/16/07	Collection of clam tissue
11/19 - 11/22/07	Collection of collocated sediment samples at clam stations
12/6/07	Collection of collocated sediment samples at clam stations

Notes:

^a For the first two days of sampling, ODFW required that set lines be left in the water for up to two hours at a time. After two days, set lines were left overnight.

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Table 3-1. Individual and Composite Sculpin Samples.

Date	Time	Sample	Weight (g)	Length (mm)	Composite Sample Code
SP01E-Alt ^a					
9/11/07	10:10	LW3-SP01E-dock6-01	48.1	151	Archive
SP01E					
8/31/07	8:34	LW3-SP01E-01	36.6	143	LW3-SP01E-C00
9/5/07	8:24	LW3-SP01E-02	41.4	147	
9/12/07	8:53	LW3-SP01E-03	28.0	140	
9/12/07	9:50	LW3-SP01E-05	14.0	116	
9/12/07	9:50	LW3-SP01E-06	16.3	111	
9/12/07	9:50	LW3-SP01E-07	24.8	135	
9/13/07	9:17	LW3-SP01E-08	36.4	154	
9/13/07	9:27	LW3-SP01E-09	46.2	157	
9/12/07	9:50	LW3-SP01E-4	5.5	88	Archive
SP01W					
8/31/07	8:06	LW3-SP01W-01	28.5	133	LW3-SP01W-C00
9/11/07	11:10	LW3-SP01W-02	18.0	110	
9/11/07	11:10	LW3-SP01W-03	11.5	104	
9/11/07	11:10	LW3-SP01W-04	19.5	111	
9/11/07	11:10	LW3-SP01W-05	20.7	115	
9/11/07	11:10	LW3-SP01W-06	17.4	109	
9/11/07	11:10	LW3-SP01W-07	12.9	104	
9/11/07	11:10	LW3-SP01W-08	23.2	120	
9/11/07	11:10	LW3-SP01W-09	9.5	90	
9/19/07	9:46	LW3-SP01W-10	9.2	94	
9/19/07	9:46	LW3-SP01W-12	17.3	116	
9/19/07	9:46	LW3-SP01W-13	12.0	98	
9/19/07	9:46	LW3-SP01W-11	8.3	88	Archive
SP03E					
8/31/07	10:45	LW3-SP03E-01	42.4	159	LW3-SP03E-C00
9/7/07	8:31	LW3-SP03E-03	32.3	139	
9/21/07	8:59	LW3-SP03E-04	23.4	121	
9/26/07	9:20	LW3-SP03E-05	36.3	139	
9/27/07	13:33	LW3-SP03E-06	14.8	109	
9/27/07	14:41	LW3-SP03E-07	22.1	130	
9/27/07	14:53	LW3-SP03E-08	26.0	131	
9/7/07	8:31	LW3-SP03E-02	25.0	88	Archive
SP04W					
9/5/07	12:28	LW3-SP04W-01	23.9	118	LW3-SP04W-C00
9/5/07	12:28	LW3-SP04W-02	27.1	122	
9/6/07	14:37	LW3-SP04W-03	15.3	104	
9/7/07	8:24	LW3-SP04W-04	22.6	122	
9/7/07	8:24	LW3-SP04W-05	29.0	140	
9/7/07	8:24	LW3-SP04W-06	46.6	151	
9/11/07	15:10	LW3-SP04W-07	39.3	142	
9/12/07	10:25	LW3-SP04W-08	73.5	175	
9/12/07	10:25	LW3-SP04W-09	53.3	160	

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Table 3-1. Individual and Composite Sculpin Samples.

Date	Time	Sample	Weight (g)	Length (mm)	Composite Sample Code
SP05E					
9/10/07	9:40	LW3-SP05E-01	19.1	109	LW3-SP05E-C00
9/10/07	9:40	LW3-SP05E-03	13.0	98	
9/10/07	9:40	LW3-SP05E-04	12.9	97	
9/12/07	13:15	LW3-SP05E-05	24.2	121	
9/12/07	13:15	LW3-SP05E-06	19.2	124	
9/13/07	13:20	LW3-SP05E-07	26.7	129	
9/14/07	9:27	LW3-SP05E-08	20.0	127	
9/24/07	9:22	LW3-SP05E-09	15.5	111	
9/26/07	15:15	LW3-SP05E-10	17.8	110	
9/26/07	15:15	LW3-SP05E-11	40.1	149	
9/10/07	9:40	LW3-SP05E-02	11.0	89	Archive
SP06W					
8/28/07	14:40	LW3-SP06W-1	11.5	100	LW3-SP06W-C00
8/28/07	14:40	LW3-SP06W-2	18.7	119	
8/28/07	14:40	LW3-SP06W-4	12.9	97	
8/28/07	14:40	LW3-SP06W-5	25.3	123	
8/28/07	14:40	LW3-SP06W-6	9.7	91	
8/28/07	14:40	LW3-SP06W-9	16.3	109	
8/28/07	14:40	LW3-SP06W-10	8.5	90	
8/28/07	14:40	LW3-SP06W-11	7.4	92	
8/30/07	15:30	LW3-SP06W-16	9.5	90	
8/30/07	15:30	LW3-SP06W-17	8.6	91	
8/30/07	15:30	LW3-SP06W-19	7.9	93	
8/31/07	11:50	LW3-SP06W-20	16.3	112	
8/31/07	11:50	LW3-SP06W-21	7.7	90	
9/4/07	10:14	LW3-SP06W-22	12.5	98	
9/4/07	10:14	LW3-SP06W-23	12.2	102	
9/4/07	10:14	LW3-SP06W-24	9.9	94	
9/10/07	14:38	LW3-SP06W-25	6.7	91	
9/10/07	14:38	LW3-SP06W-26	11.6	98	
9/10/07	14:38	LW3-SP06W-27	8.2	92	
9/10/07	14:38	LW3-SP06W-29	12	94	
8/28/07	14:40	LW3-SP06W-3	8.8	88	Archive
8/28/07	14:40	LW3-SP06W-7	8.0	86	
8/28/07	14:40	LW3-SP06W-8	8.7	89	
8/28/07	14:40	LW3-SP06W-12	8.2	88	
8/28/07	14:40	LW3-SP06W-13	7.5	87	
8/29/07	9:50	LW3-SP06W-14	6.3	86	
8/29/07	9:50	LW3-SP06W-15	6.9	85	
8/30/07	15:30	LW3-SP06W-18	7.2	87	
9/10/07	14:38	LW3-SP06W-28	9.8	85	

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Table 3-1. Individual and Composite Sculpin Samples.

Date	Time	Sample	Weight (g)	Length (mm)	Composite Sample Code	
SP07E						
8/29/07	12:30	LW3-SP07E-01	65.6	164	LW3-SP07E-C00	
9/4/07	10:50	LW3-SP07E-03	8.6	97		
9/5/07	11:35	LW3-SP07E-04	21.9	121		
9/5/07	13:25	LW3-SP07E-05	76.6	173		
9/5/07	13:25	LW3-SP07E-06	10.1	90		
9/7/07	10:30	LW3-SP07E-08	31.8	139		
9/7/07	10:30	LW3-SP07E-09	11.9	91		
9/10/07	15:10	LW3-SP07E-10	25.0	124		
9/20/07	12:07	LW3-SP07E-11	19.0	126		
9/20/07	12:07	LW3-SP07E-12	8.4	91		
9/21/07	12:24	LW3-SP07E-13	27.3	127		
8/30/07	15:30	LW3-SP07E-02	6.1	77		Archive
9/5/07	13:25	LW3-SP07E-07	7.5	85		
SP07W						
9/6/07	14:20	LW3-SP07W-01	12.9	103	LW3-SP07W-C00	
9/7/07	9:50	LW3-SP07W-02	24.1	118		
9/7/07	9:50	LW3-SP07W-03	14.3	101		
9/7/07	9:50	LW3-SP07W-04	18.5	109		
9/7/07	9:50	LW3-SP07W-05	12.0	90		
9/11/07	10:37	LW3-SP07W-07	34.9	138		
9/11/07	10:37	LW3-SP07W-08	23.1	121		
9/19/07	10:29	LW3-SP07W-09	15.1	112		
9/26/07	11:35	LW3-SP07W-10	19.1	123		
9/27/07	11:31	LW3-SP07W-11	21.8	126		
9/7/07	9:50	LW3-SP07W-06	19.0	88		Archive
SP08E						
8/28/07	11:10	LW3-SP08E-01	17.2	115	LW3-SP08E-C00	
8/28/07	11:10	LW3-SP08E-02	12.5	98		
8/28/07	11:10	LW3-SP08E-03	15.6	104		
8/28/07	11:10	LW3-SP08E-04	16.7	110		
8/28/07	11:10	LW3-SP08E-05	6.4	83		
8/28/07	11:10	LW3-SP08E-06	18.6	117		
8/28/07	11:10	LW3-SP08E-07	12.7	100		
8/28/07	11:10	LW3-SP08E-08	14.6	106		
8/28/07	11:10	LW3-SP08E-09	19.6	120		
8/28/07	11:10	LW3-SP08E-10	12.1	104		
8/28/07	11:10	LW3-SP08E-11	8.3	112		
8/29/07	11:03	LW3-SP08E-13	38.7	147		
8/30/07	14:30	LW3-SP08E-14	15.8	107		
8/30/07	14:30	LW3-SP08E-15	14.5	106		
8/30/07	14:30	LW3-SP08E-16	9.1	91		
8/30/07	14:30	LW3-SP08E-18	7.5	92		
8/30/07	14:30	LW3-SP08E-19	34.2	133		
9/4/07	9:50	LW3-SP08E-20	17.4	113		
9/4/07	9:50	LW3-SP08E-21	22.8	130		
9/4/07	9:50	LW3-SP08E-22	10.6	106		
8/29/07	11:03	LW3-SP08E-12	6.2	82		Archive
8/30/07	14:30	LW3-SP08E-17	7.8	88		

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Table 3-1. Individual and Composite Sculpin Samples.

Date	Time	Sample	Weight (g)	Length (mm)	Composite Sample Code
SP08W					
8/29/07	11:45	LW3-SP09W-01 ^b	9.7	90	
8/31/07	9:50	LW3-SP08W-02	25.7	128	
8/31/07	9:50	LW3-SP08W-03	25.6	125	
8/31/07	9:50	LW3-SP08W-04	19.2	112	
8/31/07	10:22	LW3-SP08W-05	43.5	158	LW3-SP08W-C00
9/11/07	10:30	LW3-SP08W-06	16.1	119	
9/11/07	13:40	LW3-SP08W-07	22.2	119	
9/11/07	13:40	LW3-SP08W-08	23.7	128	
9/25/07	8:38	LW3-SP08W-09	33.2	144	
9/25/07	8:38	LW3-SP08W-10	17.8	111	
SP09W					
9/13/07	10:50	LW3-SP09W-01	30.3	131	
9/14/07	10:55	LW3-SP09W-02	27.2	133	
9/14/07	10:55	LW3-SP09W-03	37.9	143	
9/18/07	11:30	LW3-SP09W-04	22.5	118	
9/20/07	10:50	LW3-SP09W-05	25.1	123	LW3-SP09W-C00
9/20/07	10:50	LW3-SP09W-06	29.9	132	
9/21/07	11:15	LW3-SP09W-07	24.5	126	
9/21/07	11:15	LW3-SP09W-08	23.0	115	
9/25/07	11:45	LW3-SP09W-09	18.3	117	
9/25/07	12:00	LW3-SP09W-10	35.2	139	
SP10E					
9/18/07	10:52	LW3-SP10E-01	62.5	166	
9/18/07	10:52	LW3-SP10E-02	40.1	151	
9/18/07	10:52	LW3-SP10E-03	28.1	126	
9/18/07	10:52	LW3-SP10E-04	21.2	112	
9/18/07	10:52	LW3-SP10E-05	12.8	101	
9/19/07	16:02	LW3-SP10E-07	38.1	142	LW3-SP10E-C00
9/19/07	16:02	LW3-SP10E-08	36.3	149	
9/19/07	16:02	LW3-SP10E-09	26.8	127	
9/19/07	16:02	LW3-SP10E-10	20.0	110	
9/19/07	16:02	LW3-SP10E-11	15.4	108	
9/19/07	16:02	LW3-SP10E-12	11.3	98	
9/19/07	16:02	LW3-SP10E-06	143.7	199	Archive
SP10W					
9/12/07	9:56	LW3-SP10W-01	46.2	148	
9/19/07	15:07	LW3-SP10W-04	26.6	124	
9/20/07	9:10	LW3-SP10W-05	32.0	138	
9/21/07	10:30	LW3-SP10W-07	24.8	127	LW3-SP10W-C00
9/21/07	10:30	LW3-SP10W-08	23.4	119	
9/21/07	10:30	LW3-SP10W-09	21.8	118	
9/21/07	10:30	LW3-SP10W-10	30.5	129	
9/21/07	10:30	LW3-SP10W-11	46.0	143	
9/21/07	9:45	LW3-SP10W-06	146.4	199	Archive
SP10W-ALT *					
9/19/07	9:38	LW3-SP10W - Alt-02	26.9	128	Archive
9/19/07	9:38	LW3-SP10W - Alt-03	16.8	112	

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Table 3-1. Individual and Composite Sculpin Samples.

Date	Time	Sample	Weight (g)	Length (mm)	Composite Sample Code
SP11E ^c					
9/14/07	11:20	LW3-SP11E-01	19.7	121	LW3-SP11E-C00
9/14/07	11:20	LW3-SP11E-02	10.1	100	
9/14/07	11:20	LW3-SP11E-03	12.3	112	
9/14/07	11:20	LW3-SP11E-04	8.7	104	
9/19/07	14:25	LW3-SP11E-05	18.6	110	
9/25/07	10:54	LW3-SP11E-06	10.8	99	
9/25/07	14:44	LW3-SP11E-07	18.0	115	
9/25/07	14:44	LW3-SP11E-08	14.7	103	
9/25/07	14:44	LW3-SP11E-09	22.8	124	
9/27/07	13:57	LW3-SP11E-10	15.8	108	
9/27/07	13:57	LW3-SP11E-11	12.5	107	
9/27/07	13:35	LW3-SP11E-12	7.6	89	
SP12E					
9/6/07	10:25	LW3-SP12E-02	46.6	147	LW3-SP12E-C00
9/6/07	10:25	LW3-SP12E-03	16.8	128	
9/6/07	10:25	LW3-SP12E-04	23.8	122	
9/6/07	10:25	LW3-SP12E-05	20.7	124	
9/6/07	10:25	LW3-SP12E-06	13.6	106	
9/6/07	10:25	LW3-SP12E-07	13.4	106	
9/6/07	10:25	LW3-SP12E-08	14.3	106	
9/6/07	10:25	LW3-SP12E-09	19.2	115	
9/6/07	10:25	LW3-SP12E-10	11.2	101	
9/6/07	10:25	LW3-SP12E-11	14.1	107	
9/5/07	9:31	LW3-SP12E-01	126.2	186	
9/6/07	10:25	LW3-SP12E-12	8.0	90	
SP12W ^a					
9/14/07	9:20	LW3-SP12W-01	29.9	131	Archive
SP12W-ALT					
9/18/2007	13:56	LW3-SP12W-Alt-02	35.1	136	LW3-SP12-ALT-C01 LW3-SP12-ALT-C02
9/18/2007	13:56	LW3-SP12W-Alt-03	13.0	102	
9/18/2007	13:56	LW3-SP12W-Alt-04	9.6	96	
9/18/2007	13:56	LW3-SP12W-Alt-05	8.4	92	
9/18/2007	13:56	LW3-SP12W-Alt-06	10.9	102	
9/18/2007	13:56	LW3-SP12W-Alt-07	7.8	90	
9/18/2007	13:56	LW3-SP12W-Alt-08	8.1	96	
9/18/2007	13:56	LW3-SP12W-Alt-09	6.6	93	
9/19/2007	13:23	LW3-SP12W-Alt-11	19.8	120	
9/19/2007	13:23	LW3-SP12W-Alt-12	22.6	123	
9/19/2007	13:23	LW3-SP12W-Alt-13	10.4	98	
9/19/2007	13:23	LW3-SP12W-Alt-14	14.8	115	
9/19/2007	13:23	LW3-SP12W-Alt-15	12.6	113	
9/19/2007	13:23	LW3-SP12W-Alt-16	10.9	93	
9/19/2007	13:23	LW3-SP12W-Alt-17	9.3	95	
9/20/2007	10:50	LW3-SP12W-Alt-21	22.7	129	
9/20/2007	10:50	LW3-SP12W-Alt-22	26.9	131	
9/20/2007	10:50	LW3-SP12W-Alt-23	24.7	128	
9/20/2007	10:50	LW3-SP12W-Alt-24	22.2	120	

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Table 3-1. Individual and Composite Sculpin Samples.

Date	Time	Sample	Weight (g)	Length (mm)	Composite Sample Code
9/20/2007	10:50	LW3-SP12W-Alt-25	21.8	123	
9/20/2007	10:50	LW3-SP12W-Alt-26	18.2	123	
9/20/2007	10:50	LW3-SP12W-Alt-27	19.0	117	
9/20/2007	10:50	LW3-SP12W-Alt-28	14.4	112	
9/20/2007	10:50	LW3-SP12W-Alt-29	13.8	109	
9/20/2007	10:50	LW3-SP12W-Alt-30	20.8	115	LW3-SP12-ALT-C01
9/20/2007	10:50	LW3-SP12W-Alt-31	9.2	96	LW3-SP12-ALT-C02
9/20/2007	10:50	LW3-SP12W-Alt-32	11.0	98	
9/20/2007	10:50	LW3-SP12W-Alt-33	7.1	96	
9/20/2007	10:50	LW3-SP12W-Alt-34	8.6	93	
9/20/2007	10:50	LW3-SP12W-Alt-35	9.1	93	
9/20/2007	10:50	LW3-SP12W-Alt-36	8.5	96	
9/20/2007	10:50	LW3-SP12W-Alt-37	8.8	95	
9/18/2007	13:56	LW3-SP12W-Alt-10	6.2	88	
9/19/2007	13:23	LW3-SP12W-Alt-18	6.9	87	
9/19/2007	13:23	LW3-SP12W-Alt-19	6.6	86	Archive
9/19/2007	13:23	LW3-SP12W-Alt-20	6.6	84	

Notes:

- ^a Locations SP01E-Alt, SP10W-Alt, and SP12W were abandoned in preference to locations SP01E, SP10W, and SP12W-Alt. Sculpin from the abandoned locations were not included in the composites.
- ^b LW3-SP09W-01 was incorrectly labeled as LW3-SP08W-01. It accounts for 4.1% of sample weight
Adjusted SP08W tissue conc. = (SP08W tissue conc. - 0.04*SP09W tissue conc.)/0.96.
- ^c Fish number LW3-SP11E-12 was included in the composite at location SP11E despite being slightly below the target size because of the limited sample mass obtained at this location.

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Table 3-2. Individual and Composite Crayfish Samples.

Date	Time	Sample	Weight (g)	Total Length (mm)	Composite Sample Code
CR01E-ALT					
9/11/07	9:26	LW3-CR01E-Dock1-Alt-04	54.6	144	LW3-CR01E-Alt-C00
9/11/07	9:36	LW3-CR01E-Dock1-Alt-05	46.7	134	
9/11/07	9:46	LW3-CR01E-Dock1-Alt-08	40.2	114	
9/11/07	9:50	LW3-CR01E-Dock1-Alt-09	41.1	109	
9/11/07	9:55	LW3-CR01E-Dock1-Alt-10	43.7	124	
9/11/07	10:00	LW3-CR01E-Dock1-Alt-11	55.5	139	
9/11/07	10:03	LW3-CR01E-Dock1-Alt-12	49.3	121	
9/11/07	9:39	LW3-CR01E-Dock1-Alt-06	51.1	128	Archive
9/11/07	9:43	LW3-CR01E-Dock1-Alt-07	74.1	139	
CR01E					
9/5/07	8:24	LW3-CR01E-01	60.6	124	Archive
9/11/07	9:11	LW3-CR01E-02	31.2	112	
9/11/07	9:15	LW3-CR01E-03	25.8	105	
CR01W					
8/30/07	9:29	LW3-CR01W-01	46.0	114	LW3-CR01W-C00
8/30/07	9:33	LW3-CR01W-02	52.5	120	
8/30/07	9:33	LW3-CR01W-03	36.2	106	
8/30/07	9:33	LW3-CR01W-04	28.3	102	
8/30/07	9:33	LW3-CR01W-05	59.0	115	
8/31/07	8:08	LW3-CR01W-06	103.9	137	
8/31/07	8:08	LW3-CR01W-07	47.0	113	
8/31/07	8:12	LW3-CR01W-08	40.6	107	
CR05W					
8/28/07	10:35	LW3-CR05W-01	68.9	123	LW3-CR05W-C00
8/28/07	10:35	LW3-CR05W-02	63.1	119	
8/28/07	10:41	LW3-CR05W-03	47.0	112	
8/28/07	10:41	LW3-CR05W-04	35.8	111	
8/28/07	10:50	LW3-CR05W-05	57.1	113	
8/29/07	8:52	LW3-CR05W-06	69.6	123	
CR06W					
8/28/07	10:12	LW3-CR06W-01	70.8	123	LW3-CR06W-C00
8/29/07	10:22	LW3-CR06W-02	40.2	108	
8/30/07	10:57	LW3-CR06W-03	31.7	101	
9/5/07	11:26	LW3-CR06W-06	53.9	119	
9/5/07	11:26	LW3-CR06W-07	62.7	123	
9/6/07	8:44	LW3-CR06W-08	43.1	112	
9/6/07	8:48	LW3-CR06W-09	82.5	131	
8/30/07	10:57	LW3-CR06W-04	31.0	96	Archive
8/31/07	10:52	LW3-CR06W-05	44.5	99	
CR08W					
8/28/07	9:42	LW3-CR08W-01	36.9	108	LW3-CR08W-C00
9/5/07	11:02	LW3-CR08W-02	30.6	104	
9/5/07	11:02	LW3-CR08W-03	40.6	108	
9/7/07	8:21	LW3-CR08W-04	30.7	102	
9/14/07	10:05	LW3-CR08W-05	28.3	109	
9/14/07	10:14	LW3-CR08W-06	31.0	120	
9/14/07	10:25	LW3-CR08W-07	35.6	116	
9/18/07	10:30	LW3-CR08W-08	55.2	112	
9/25/07	8:38	LW3-CR08W-09	74.4	121	
9/25/07	8:38	LW3-CR08W-10	30.7	107	

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Table 3-2. Individual and Composite Crayfish Samples.

Date	Time	Sample	Weight (g)	Total Length (mm)	Composite Sample Code
CR10W					
8/28/07	9:12	LW3-CR10W-01	54.2	115	LW3-CR10W-C00
8/28/07	9:12	LW3-CR10W-02	67.9	115	
8/28/07	9:12	LW3-CR10W-03	37.2	107	
8/29/07	9:35	LW3-CR10W-04	36.1	111	
8/29/07	9:35	LW3-CR10W-05	50.2	107	
8/30/07	12:44	LW3-CR10W-06	29.9	102	
8/30/07	12:52	LW3-CR10W-07	47.4	111	
8/30/07	12:52	LW3-CR10W-08	58.9	112	
8/30/07	12:52	LW3-CR10W-09	43.4	103	
CR11E					
8/31/07	10:01	LW3-CR11E-01	38.1	106	LW3-CR11E-C01 LW3-CR11E-C02
9/5/07	10:33	LW3-CR11E-02	45.8	111	
9/5/07	10:33	LW3-CR11E-03	65.2	112	
9/5/07	10:33	LW3-CR11E-04	55.0	107	
9/5/07	10:33	LW3-CR11E-05	51.8	114	
9/5/07	10:45	LW3-CR11E-06	48.8	109	
9/6/07	10:08	LW3-CR11E-07	83.0	129	
9/6/07	10:13	LW3-CR11E-08	48.0	107	
CR12E					
8/31/07	9:15	LW3-CR12E-01	46.6	102	LW3-CR12E-C00
8/31/07	9:15	LW3-CR12E-02	33.9	108	
9/5/07	9:25	LW3-CR12E-03	32.3	103	
9/5/07	9:25	LW3-CR12E-04	28.0	102	
9/5/07	9:25	LW3-CR12E-05	35.4	111	
9/5/07	9:50	LW3-CR12E-06	51.1	113	
9/5/07	9:50	LW3-CR12E-07	65.0	123	
9/5/07	9:56	LW3-CR12E-08	35.2	107	
CR12W					
8/31/07	9:31	LW3-CR12W-01	38.1	106	LW3-CR12W-C00
8/31/07	9:31	LW3-CR12W-02	34.9	105	
8/31/07	9:38	LW3-CR12W-03	60.3	112	
8/31/07	9:38	LW3-CR12W-04	34.3	105	
8/31/07	9:42	LW3-CR12W-05	46.1	106	
8/31/07	9:42	LW3-CR12W-06	39.2	111	
9/5/07	10:11	LW3-CR12W-08	51.5	108	
9/5/07	10:17	LW3-CR12W-09	43.1	104	
9/5/07	10:17	LW3-CR12W-10	40.9	101	
9/5/07	10:08	LW3-CR12W-07	27.4	97	

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Table 3-3. Individual and Composite Smallmouth Bass Samples.

Date	Time	Sample	Weight (g)	Total Length (mm)	Body Weight ^a (g)	Fillet Weight (g)	Composite Sample Code
SB02E							
9/11/07	8:25	LW3-SB02E-4	525.0	312	331.4	191.0	LW3-SB02E-C00B LW3-SB02E-C00F
9/4/07	10:12	LW3-SB02E-2	286.5	269	202.8	81.3	
9/11/07	8:42	LW3-SB02E-5	233.3	259	155.0	76.8	
9/7/07	9:30	LW3-SB02E-3	243.0	257	190.9	51.4	
9/11/07	9:27	LW3-SB02E-6	205.4	234	130.1	74.4	
9/4/07	8:10	LW3-SB02E-1	171.5	220	116.6	50.3	Archive
SB03E							
9/7/07	10:55	LW3-SB03E-5	394.2	301	298.7	93.6	LW3-SB03E-C00B LW3-SB03E-C00F
9/11/07	9:44	LW3-SB03E-6	416.8	296	288.4	125.0	
9/4/07	11:30	LW3-SB03E-1	285.6	280	209.2	74.2	
9/4/07	11:30	LW3-SB03E-2	268.7	266	192.1	74.4	
9/4/07	11:55	LW3-SB03E-3	182.2	229	126.3	54.1	
9/7/07	10:00	LW3-SB03E-4	164.6	224	125.7	38.1	Archive
9/11/07	9:46	LW3-SB03E-7	176.3	232	115.4	60.2	
SB03W							
9/4/07	11:54	LW3-SB03W-4	509.7	326	401.4	106.4	LW3-SB03W-C00B LW3-SB03W-C00F
9/4/07	11:31	LW3-SB03W-1	355.4	300	272.3	79.2	
9/4/07	12:05	LW3-SB03W-5	307.5	287	223.2	83.2	
9/4/07	11:33	LW3-SB03W-2	230.3	258	162.8	65.4	
9/4/07	11:52	LW3-SB03W-3	196.1	250	134.9	59.8	
SB04E							
9/4/07	14:45	LW3-SB04E-2	1034.7	397	810.6	219.1	LW3-SB04E-C01B LW3-SB04E-C02B LW3-SB04E-C01F LW3-SB04E-C02F
9/4/07	15:00	LW3-SB04E-3	636.2	351	495.2	153.8	
9/10/07	14:15	LW3-SB04E-7	516.3	318	372.9	140.1	
9/10/07	14:45	LW3-SB04E-6	532.6	315	355.8	170.5	
9/11/07	10:34	LW3-SB04E-9	438.4	299	338.2	97.5	
9/11/07	10:54	LW3-SB04E-10	253.4	249	164.9	87.1	Archive
9/11/07	10:25	LW3-SB04E-8	228.5	247	139.3	87.5	
9/10/07	14:15	LW3-SB04E-5	228.9	245	171	56.7	
9/4/07	15:20	LW3-SB04E-4	192.8	238	149.9	41.6	
SB04W							
9/4/07	14:36	LW3-SB04W-4	781.3	368	574.4	204.7	LW3-SB04W-C00B LW3-SB04W-C00F
9/4/07	14:20	LW3-SB04W-3	718.5	356	536.2	178.0	
9/4/07	15:25	LW3-SB04W-6	298.5	301	188.3	108.9	
9/5/07	8:15	LW3-SB04W-7	334.9	294	250.2	83.6	
9/4/07	14:38	LW3-SB04W-5	341.7	289	250.1	89.2	
9/4/07	12:42	LW3-SB04W-2	228.8	254	169.2	58.1	Archive
9/4/07	12:37	LW3-SB04W-1	179.6	235	134.1	44.7	
SB05W							
9/5/07	9:35	LW3-SB05W-5	582.8	331	419.6	161.1	LW3-SB05W-C00B LW3-SB05W-C00F
9/5/07	9:14	LW3-SB05W-2	569.3	330	426.4	139.6	
9/5/07	9:18	LW3-SB05W-4	368.4	306	284.0	82.8	
9/5/07	10:36	LW3-SB05W-9	337.1	290	262.6	73.0	
9/5/07	10:50	LW3-SB05W-10	314.1	282	242.1	70.6	
9/5/07	8:53	LW3-SB05W-1	281.9	277	201.3	79.1	Archive
9/5/07	9:50	LW3-SB05W-6	219.6	269	169.4	49.2	
9/5/07	9:16	LW3-SB05W-3	207.1	246	157.4	48.4	
9/5/07	10:35	LW3-SB05W-8	148.1	220	115.9	31.1	
9/5/07	10:08	LW3-SB05W-7	142.1	218	107.5	33.1	
SB06E							
9/6/07	7:40	LW3-SB06E-2	386.7	308	293.0	92.1	LW3-SB06E-C00B LW3-SB06E-C00F
9/10/07	10:24	LW3-SB06E-7	276.9	283	203.4	72.1	
9/10/07	9:50	LW3-SB06E-5	312.2	279	235.9	75.0	
9/5/07	9:40	LW3-SB06E-1	208.9	254	162.5	45.1	
9/10/07	12:32	LW3-SB06E-8	164.2	229	120.4	43.2	
9/10/07	9:52	LW3-SB06E-6	150.6	225	100.8	48.4	Archive

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Table 3-3. Individual and Composite Smallmouth Bass Samples.

Table 3. Data for LW3 and LW4 Composite Sample				Total Length	Body	Fillet	Composite Sample
Date	Time	Sample	Weight (g)	(mm)	Weight ^a (g)	Weight (g)	Code
SB06W							
9/5/07	15:26	LW3-SB06W-9	327.8	289	247.2	78.0	LW3-SB06W-C00B LW3-SB06W-C00F
9/5/07	15:24	LW3-SB06W-8	278.0	280	206.5	70.2	
9/5/07	14:42	LW3-SB06W-6	221.2	264	168.1	51.5	
9/5/07	11:16	LW3-SB06W-2	186.2	257	143.2	41.5	
9/5/07	15:23	LW3-SB06W-7	210.8	257	157.4	50.6	
9/5/07	11:10	LW3-SB06W-1	718.2	372	530.4	185.9	Archive
9/5/07	11:28	LW3-SB06W-3	676.9	368	516.7	162.2	
9/5/07	11:37	LW3-SB06W-4	225.4	251	169.8	54.1	
9/5/07	12:12	LW3-SB06W-5	167.3	231	126.9	39.2	
SB07E							
9/5/07	11:01	LW3-SB07E-1	617.0	357	483.6	130.3	LW3-SB07E-C00B LW3-SB07E-C00F
9/5/07	11:20	LW3-SB07E-3	589.8	351	422.0	165.8	
9/11/07	11:47	LW3-SB07E-6	522.3	325	330.0	189.3	
9/5/07	12:35	LW3-SB07E-5	464.7	324	335.2	126.0	
9/5/07	11:15	LW3-SB07E-2	286.1	277	216.8	67.8	
9/5/07	12:17	LW3-SB07E-4	243.2	259	189.6	51.5	Archive
9/11/07	11:50	LW3-SB07E-7	213.4	253	142.2	70.0	
SB07W							
9/6/07	9:30	LW3-SB07W-7	469.3	334	354.5	113.0	LW3-SB07W-C00B LW3-SB07W-C00F
9/6/07	8:46	LW3-SB07W-5	430.4	308	331.4	97.0	
9/6/07	9:12	LW3-SB07W-6	389.2	305	294.9	92.8	
9/6/07	9:40	LW3-SB07W-8	416.9	302	320.6	94.0	
9/6/07	7:27	LW3-SB07W-1	339.2	299	260.0	77.9	
9/6/07	8:14	LW3-SB07W-2	336.3	287	256.4	81.7	Archive
9/6/07	8:28	LW3-SB07W-3	268.2	272	214.2	52.8	
9/6/07	8:45	LW3-SB07W-4	143.7	239	112.7	30.1	
SB08E							
9/5/07	14:01	LW3-SB08E-1	216.0	256	151.4	62.7	LW3-SB08E-C00B LW3-SB08E-C00F
9/5/07	14:45	LW3-SB08E-2	531.3	320	393.5	133.7	
9/5/07	15:05	LW3-SB08E-3	444.0	311	341.0	100.1	
9/5/07	15:05	LW3-SB08E-4	461.7	315	346.9	113.5	
9/5/07	15:30	LW3-SB08E-5	443.7	306	340.6	101.1	
SB08W							
9/6/07	12:45	LW3-SB08W-10	384.9	299	249.2	132.8	LW3-SB08W-C00B LW3-SB08W-C00F
9/10/07	9:16	LW3-SB08W-11	224.1	255	163.8	59.4	
9/11/07	12:34	LW3-SB08W-12	212.0	249	138.0	72.7	
9/6/07	10:04	LW3-SB08W-6	430.7	309	267.3	160.5	
9/6/07	12:25	LW3-SB08W-9	184.4	234	140.1	42.6	
9/6/07	9:54	LW3-SB08W-5	619.0	365	342.0	274.8	Archive
9/6/07	11:20	LW3-SB08W-7	176.9	228	120.8	53.3	
9/6/07	11:40	LW3-SB08W-8	630.4	362	404.3	222.7	
SB09E							
9/6/07	11:12	LW3-SB09E-4	557.8	336	440.8	114.8	LW3-SB09E-C00B LW3-SB09E-C00F
9/6/07	11:24	LW3-SB09E-5	587.5	329	365.4	217.2	
9/6/07	9:25	LW3-SB09E-2	454.6	319	271.1	167.7	
9/6/07	9:10	LW3-SB09E-1	379	298	229.8	146.9	
9/11/07	14:10	LW3-SB09E-6	246	267	155.6	88	
9/6/07	10:42	LW3-SB09E-3	161.4	227	105.7	56.5	Archive
SB09W							
9/6/07	15:48	LW3-SB09W-6	719.9	354	565.4	157.0	LW3-SB09W-C00B LW3-SB09W-C00F
8/28/07	11:40	LW3-SB09W-1	605.9	351	428.5	172.8	
9/11/07	13:40	LW3-SB09W-8	390.8	318	256.5	132.4	
8/31/07	9:50	LW3-SB09W-2	407.2	314	292.9	111.7	
9/6/07	15:48	LW3-SB09W-7	382.3	306	228.6	147.3	
9/5/07	10:30	LW3-SB09W-4	262.2	267	193.7	67.6	
9/6/07	14:55	LW3-SB09W-5	214.5	256	165.8	48.0	Archive
8/31/07	9:50	LW3-SB09W-3	154.8	231	113.2	42.6	

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Table 3-3. Individual and Composite Smallmouth Bass Samples.

Date	Time	Sample	Weight (g)	Total Length (mm)	Body Weight ^a (g)	Fillet Weight (g)	Composite Sample Code
SB10E							
9/11/07	14:35	LW3-SB10E-6	559.3	334	375.9	180.9	LW3-SB010E-C00B LW3-SB010E-C00F
9/11/07	15:00	LW3-SB10E-7	496.9	334	308.9	185.5	
9/6/07	12:50	LW3-SB10E-3	580.3	328	446.2	131.3	
9/6/07	13:50	LW3-SB10E-5	384.6	308	293.7	88.9	
9/6/07	12:06	LW3-SB10E-2	458.7	312	300.2	154.6	
9/6/07	11:55	LW3-SB10E-1	259.9	365	195.8	62.3	Archive
9/6/07	13:13	LW3-SB10E-4	157.4	231	120.8	35.7	
SB10W							
9/14/07	8:28	LW3-SB10W-8	521.0	328	330.8	192.7	LW3-SB010W-C00B LW3-SB010W-C00F
9/10/07	7:30	LW3-SB10W-7	363.7	306	284.9	77.8	
9/17/07	8:40	LW3-SB10W-9	264.5	274	158.0	104.1	
9/5/07	10:20	LW3-SB10W-1	215.0	258	158.6	55.8	
9/7/07	7:55	LW3-SB10W-4	212.8	251	159.0	52.3	
9/7/07	11:27	LW3-SB10W-2	133.6	220	101.3	31.6	Archive
9/7/07	11:30	LW3-SB10W-3	843.3	403	616.0	225.0	
9/10/07	8:52	LW3-SB10W-6	198.4	246	147.5	49.6	
9/10/07	7:35	LW3-SB10W-5	166.9	227	105.2	59.9	
SB11E ^b							
9/6/07	15:43	LW3-SB11E-6	478.9	314	366.9	110.2	LW3-SB011E-C00B LW3-SB011E-C00F ^b
9/6/07	15:25	LW3-SB11E-5	289.2	266	216.9	71.0	
9/6/07	15:10	LW3-SB11E-3	295.3	263	226.0	68.1	
9/6/07	15:12	LW3-SB11E-4	212.7	251	162.8	48.7	
9/6/07	14:15	LW3-SB11E-7	183.5	234	142.5	40.1	
9/5/07	8:35	LW3-SB11W-11 ^b	233.2	261	177.9	52.9	Archive
9/6/07	14:25	LW3-SB11E-8	145.3	223	111.9	32.6	
9/6/07	14:25	LW3-SB11E-2	144.7	220	105.3	38.8	
SB11W							
9/7/07	9:05	LW3-SB11W-3	269.3	371	210.7	56.2	LW3-SB011W-C00B LW3-SB011W-C00F
9/7/07	10:24	LW3-SB11W-6	263.9	369	199.4	63.5	
9/11/07	15:20	LW3-SB11W-9	511.5	338	351.3	147.3	
9/7/07	9:02	LW3-SB11W-2	576.6	327	445.4	128.3	
9/7/07	10:28	LW3-SB11W-7	332.9	286	257.1	74.4	
9/7/07	10:33	LW3-SB11W-8	234.5	259	174.1	59.7	Archive
9/7/07	10:03	LW3-SB11W-5	185.5	239	138.7	46.2	
9/11/07	15:25	LW3-SB11W-10	178.2	238	119.1	57.9	
9/7/07	9:31	LW3-SB11W-4	165.8	225	128.2	36.4	
9/7/07	9:01	LW3-SB11W-1	158.5	223	129.3	28.4	
9/5/07	8:35	LW3-SB11W-12	144.7	220	105.3	38.8	

Notes:

^a Body = carcass of whole-body fish after filleting

^b Smallmouth bass LW3-SB11W-11 from the west side of the river was mislabeled at the field lab as LW3-SB11E-1 and was used for composites LW3 SB011E-C00B and LW3 SB011E-C00F.

Adjusted 11E fillet concentration = (11E fillet concentration - 0.15*11W fillet concentration)/0.85

Adjusted 11E body concentration = (11E body concentration - 0.15*11W body concentration)/0.85

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Table 3-4. Individual and Composite Carp Tissue Samples.

Date	Time	Sample	Weight (g)	Total Length (mm)	Body Weight ^a (g)	Fillet Weight (g)	Comp	Composite Sample Code
CP0004								
18-Sep-07	10:00	LW3-CP0004-5	3005.1	546	2324.7	680.8	1	
18-Sep-07	12:55	LW3-CP0004-6	2587.8	551	1935.3	640.8	1	LW3-CP0004-C10B
19-Sep-07	9:20	LW3-CP0004-8	2608.2	571	2004.2	550.2	1	LW3-CP0004-C10F
19-Sep-07	15:35	LW3-CP0004-12	2158.1	531	1533.2	615.8	1	
20-Sep-07	12:00	LW3-CP0004-15	2606.6	549	1937.5	664.7	1	
18-Sep-07	14:20	LW3-CP0004-7	2579.5	556	2000.7	568.9	2	
19-Sep-07	13:45	LW3-CP0004-11	3685.4	622	2721.6	957.7	2	LW3-CP0004-C20B
20-Sep-07	11:10	LW3-CP0004-14	1896.6	512	1274.3	620.2	2	LW3-CP0004-C20F
25-Sep-07	11:55	LW3-CP0004-16	2610.4	529	1837.1	759.3	2	
14-Sep-07	12:45	LW3-CP0004-17	2173.1	529	1720.1	439.8	2	
17-Sep-07	12:40	LW3-CP0004-2	2060.6	527	1430.1	603.6	3	
18-Sep-07	9:15	LW3-CP0004-4	2413.6	579	1730.4	657.0	3	LW3-CP0004-C30B
19-Sep-07	10:00	LW3-CP0004-9	3855.5	625	3089.1	783.2	3	LW3-CP0004-C30F
19-Sep-07	13:40	LW3-CP0004-10	2385.4	526	1748.8	629.3	3	
18-Sep-07	9:10	LW3-CP0004-13	2018.4	507	1469.1	539.1	3	
14-Sep-07	12:45	LW3-CP0004-1	1999.7	495	1643.5	348.7		Archive
17-Sep-07	14:50	LW3-CP0004-3	2587.8	551	3515.3	1507.4		
CP0408								
9/12/07	17:12	LW3-CP0408-2	1953.2	523	1359.3	578.3	1	
9/13/07	12:15	LW3-CP0408-7	2063.1	539	1544.8	497.7	1	LW3-CP0408-C10B
9/18/07	13:30	LW3-CP0408-12	2324.7	541	1871.1	468.6	1	LW3-CP0408-C10F
9/13/07	11:14	LW3-CP0408-5	2505.5	544	1783.4	705.2	1	
9/20/07	12:00	LW3-CP0408-15	3764.8	613	2731.0	1073.3	1	
9/13/07	11:45	LW3-CP0408-6	2069.2	522	1412.3	638.4	2	
9/14/07	11:40	LW3-CP0408-9	2297.3	555	1674.6	562.1	2	LW3-CP0408-C20B
9/13/07	11:07	LW3-CP0408-3	2526.9	559	1758.8	746.7	2	LW3-CP0408-C20F
9/20/07	9:10	LW3-CP0408-13	2563.1	554	1887.4	672.3	2	
9/21/07	10:33	LW3-CP0408-16	2820.0	556	1992.9	821.4	2	
9/17/07	14:15	LW3-CP0408-11	2109.1	539	1677.5	414.3	3	
9/13/07	11:12	LW3-CP0408-4	2144.5	520	1562.4	556.1	3	LW3-CP0408-C30B
9/14/07	10:51	LW3-CP0408-8	2352.0	534	1699.8	586.5	3	LW3-CP0408-C30F
9/20/07	15:35	LW3-CP0408-14	2386.6	536	1670.2	711.5	3	
9/21/07	10:40	LW3-CP0408-17	3600.4	631	2523.6	1084.7	3	
9/17/07	10:50	LW3-CP0408-10	1084.3	507	1208.0	588.3		Archive
CP0812								
9/24/07	14:00	LW3-CP0812-12	2092.3	529	1442.6	642.4	1	LW3-CP0812-C11F
9/25/07	9:00	LW3-CP0812-13	1961.3	513	1233.9	724.7	1	LW3-CP0812-C12F
9/21/07	11:00	LW3-CP0812-2	3997.3	663	2660.6	1333.9	1	LW3-CP0812-C11B
9/24/07	15:50	LW3-CP0812-8	2348.5	550	1712.5	629.2	1	LW3-CP0812-C12B
9/24/07	16:10	LW3-CP0812-9	3231.9	603	2220.4	1009.1	1	
9/25/07	12:10	LW3-CP0812-14	2651.2	569	1748.7	891.6	2	
9/25/07	12:10	LW3-CP0812-15	2060.1	512	1429.5	627.3	2	LW3-CP0812-C20B
9/24/07	11:30	LW3-CP0812-4	2307.7	530	1642.6	642.5	2	LW3-CP0812-C20F
9/24/07	14:34	LW3-CP0812-6	3402.0	625	2465.1	929.3	2	
9/24/07	15:35	LW3-CP0812-7	4224.1	651	3231.8	1005.5	2	
9/17/07	14:50	LW3-CP0812-1	2915.6	603	2310.7	580.8	3	
9/25/07	14:25	LW3-CP0812-10	2723.0	677	1814.8	894.4	3	LW3-CP0812-C30B
9/24/07	10:10	LW3-CP0812-11	2333.2	529	1730.6	578.3	3	LW3-CP0812-C30F
9/24/07	10:15	LW3-CP0812-3	2279.2	528	1624.5	636.3	3	
9/24/07	14:18	LW3-CP0812-5	1743.1	529	1192.9	547.2	3	

Notes:

^a Body = carcass of whole-body fish after filleting

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Table 3-5. Individual and Composite Clam Tissue Samples.

Station ID	Location	Total Number of Tows	Number of Clams	Estimated Total Biomass (g ww) ^a	Estimated Biomass of Nondepurated and Depurated Clams (g ww) ^a	Sample ID	Actual Biomass (g ww) ^a
CA01E	Offshore of Terminal 5	15	240	180.73	118.58 57.65	LW3-CA01E-C00 LW3-CA01E-C00D	186.91 107.10
CA02W	Offshore of Sauvie Island	16	87	92.16	74.65 17.11	LW3-CA02W-C00 LW3-CA02W-C00D	130.11 27.91
CA03W	Between Multnomah Channel and RM 4.6	18	37	40.07	40.07	LW3-CA03W-C00	43.59
CA04W	Between Multnomah Channel and RM 4.6	16	24	35.91	35.91	LW3-CA04W-C00	53.02
CA05E	Downstream of Mar Com near RM 5.5	15	53	73.28	73.28	LW3-CA05E-C00	110.87
CA05W	Between RM 4.8 and 6.0	24	29	38.67	38.67	LW3-CA05W-C00	51.09
CA10W	Sulzer Pumps	16	49	87.84	77.10 12.70	LW3-CA10W-C00 LW3-CA10W-C00D	144.34 17.03
CA11E	Cargill	11	92	149.70	76.03 70.24	LW3-CA11E-C00 LW3-CA11E-C00D	124.68 151.98
CA12W	Historic MGP	29 ^b	55 ^c	31.29 ^c	31.29 ^c	LW3-CA12E-C00	107.44
CA12E	East Bank Esplanade	19	78	110.76	75.00 36.20	LW3-CA12E-C00D LW3-CA12W-C00	60.42 35.59

Notes:

^a Biomass estimated based on the equation: $y = 0.1841 x^{(2.003)}$. The estimated nondepurated and depurated biomasses do not add up to the total estimated biomass because of variation in length measurements (all larger clams were re-measured during the process of creating the depurated and nondepurated samples) and because the small clams (<1 cm) were not re-measured for these biomass estimates but just included in the two samples. Depurated sample IDs end with "D".

^b The number of tows includes 10 tows done on the inside of the dock.

^c Excluding one clam from tow 1 taken inside the dock (estimated weight 0.41 g ww)

ww = wet weight

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Table 3-6. Individual and Composite Collocated Sediment Grab Samples.

Table 9-3. Individual and Composite Collocated Sediment Grab Samples.											
Date	Time	Station ID	Grab No.	Grab Penetration Depth (cm)	Water Depth (ft) ^a	Composite Sample ID ^b	Sample Location ^c		Sample Location ^c		Comments
							NAD 1983, Oregon North		NAD 1983, Decimal Minutes		
							X-Easting	Y-Northing	Lat	Long	
Collocated Sediments for Crayfish and Sculpin Stations											
10/15/2007	13:12	GCR01E-ALT-A	1	10	--						
10/15/2007	13:28	GCR01E-ALT-B	1	11	--	LW3-GCR01E-C00	7621174.678	728401.5582	45° 38.532'	122° 46.300'	
10/15/2007	13:40	GCR01E-ALT-C	1	13	--						
10/15/2007	14:04	GSP01E-A	1	14	--						
10/15/2007	14:24	GSP01E-B	1	11	--	LW3-GSP01E-C00	7619698.238	727211.189	45° 38.329'	122° 46.639'	
10/15/2007	14:36	GSP01E-C	1	15	--						
10/16/2007	8:57	GCRSP01W-A	4	11	11						
10/16/2007	9:16	GCRSP01W-B	2	19	--	LW3-GCRSP01W-C00	7618477.068	727987.2541	45° 38.451'	122° 46.930'	
10/16/2007	9:32	GCRSP01W-C	2	13	--						
10/16/2007	10:25	GSP03E-A	5	10	--						
10/16/2007	10:40	GSP03E-B	1	19	--	LW3-GSP03E-C00	7617539.031	717786.2115	45° 36.769'	122° 47.082'	
10/16/2007	10:54	GSP03E-C	1	13	--						
10/16/2007	12:26	GSP04W-A	1	14	--						
10/16/2007	12:13	GSP04W-B	2	10	--	LW3-GSP04W-C00	7618142.03	712679.7342	45° 35.932'	122° 46.907'	
10/16/2007	11:48	GSP04W-C	2	10	--						
10/16/2007	14:35	GSP05E-A	2	10	--						
10/16/2007	14:52	GSP05E-B	2	15	--	LW3-GSP05E-C00	7621767.809	709097.6733	45° 35.359'	122° 46.034'	
10/16/2007	14:40	GSP05E-C	10	18	--						
10/16/2007	13:37	GCR05W-A	1	17	--						
10/16/2007	13:52	GCR05W-B	1	11	--	LW3-GCR05W-C00	7621391.107	707873.3768	45° 35.156'	122° 46.114'	
10/16/2007	14:09	GCR05W-C	2	15	--						
10/17/2007	9:20	GCRSP06W-A	1	18	--						
10/17/2007	9:50	GCRSP06W-B	1	17	--	LW3-GCRSP06W-C00	7624547.673	705315.3412	45° 34.750'	122° 45.358'	
10/17/2007	10:05	GCRSP06W-C	1	13	--						
10/17/2007	10:32	GSP07E-A	3	19	--						
10/17/2007	10:57	GSP07E-B	3	19	--	LW3-GSP07E-C00	7629620.468	703266.4193	45° 34.436'	122° 44.157'	
10/17/2007	11:12	GSP07E-C	2	19	--						
10/15/2007	15:36	GSP07W-A	1	19	30						
10/15/2007	15:56	GSP07W-B	1	12	30	LW3-GSP07W-C00	7628811.557	700370.1529	45° 33.956'	122° 44.327'	
10/15/2007	16:19	GSP07W-C	1	16	23						
10/15/2007	9:30	GSP08E-A	1	12	--						
10/15/2007	10:23	GSP08E-B	4	10	--	LW3-GSP08E-C00	7633755.464	701678.2454	45° 34.194'	122° 43.178'	
10/15/2007	9:47	GSP08E-C	1	10	--						
10/15/2007	10:57	GCRSP08W-A	1	19	--						
10/15/2007	11:24	GCRSP08W-B	1	19	--	LW3-GCRSP08W-C00	7633177.373	696900.2104	45° 33.405'	122° 43.282'	
10/15/2007	12:00	GCRSP08W-C	1	19	--						
10/17/2007	12:15	GSP09W-A	1	11	--						
10/17/2007	13:00	GSP09W-B	6	10	--	LW3-GSP09W-C00	7635247.484	695725.8267	45° 33.221'	122° 42.790'	Eckmann sampler
10/17/2007	13:11	GSP09W-C	3	11	--						Eckmann sampler
10/17/2007	13:38	GSP10E-A	1	13	--						
10/17/2007	14:10	GSP10E-B	3	10	--	LW3-GSP10E-C00	7639808.94	694779.3056	45° 33.086'	122° 41.716'	
10/17/2007	14:20	GSP10E-C	1	14	--						

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Table 3-6. Individual and Composite Collocated Sediment Grab Samples.

Date	Time	Station ID	Grab No.	Grab Penetration Depth (cm)	Water Depth (ft) *	Composite Sample ID ^b	Sample Location ^c		Sample Location ^c		Comments
							NAD 1983, Oregon North		NAD 1983, Decimal Minutes		
							X-Easting	Y-Northing	Lat	Long	
10/17/2007	14:49	GCR10W-A	1	14	--	LW3-GCR10W-C00	7639558.669	692905.2312	45° 32.777'	122° 41.763'	
10/17/2007	15:00	GCR10W-B	1	10	--						
10/17/2007	16:14	GCR10W-C	6	19	--						
10/18/2007	9:05	GSP10W-A	1	19	30	LW3GSP10W-C00	7639844.364	692577.9881	45° 32.724'	122° 41.694'	
10/18/2007	9:24	GSP10W-B	2	17	30						
10/18/2007	9:37	GSP10W-C	2	15	30						
10/18/2007	10:58	GCRSP11E-A	5	12	18	LW3-GCRSP11E-C00	7644357.169	689209.5283	45° 32.190'	122° 40.616'	
10/18/2007	11:08	GCRSP11E-B	3	10	20						
10/18/2007	11:33	GCRSP11E-C	6	10	28						
10/18/2007	16:36	GSP12W-ALT-A	4	14	39	LW3-GSP12W-ALT-C00	7645665.783	686287.2658	45° 31.715'	122° 40.291'	
10/18/2007	16:54	GSP12W-ALT-B	6	13	44						
10/18/2007	17:11	GSP12W-ALT-C	6	12	43						
10/18/2007	14:42	GCR12W-A	1	11	17	LW3-GCR12W-C00	7645871.654	685815.6859	45° 31.638'	122° 40.240'	
10/18/2007	14:53	GCR12W-B	1	10	12						
10/18/2007	15:15	GCR12W-C	6	12	12						
10/18/2007	13:58	GCRSP12E-A	13	12	26	LW3-GCRSP12E-C00	7647003.642	685657.6323	45° 31.617'	122° 39.974'	
10/18/2007	13:41	GCRSP12E-B	10	12	15						
10/18/2007	12:46	GCRSP12E-C	1	11	18						
Collocated Sediments for Clam Stations											
11/19/2007	11:33	GCA01E-1d	4	12	--	LW3-GCA01E-C00	7618903.405	726478.4791	45° 38.205'	122° 46.820'	
11/19/2007	11:39	GCA01E-2a	1	13	--						
11/19/2007	11:46	GCA01E-3a	1	13	--						
11/19/2007	11:53	GCA01E-4a	1	12	--	LW3-GCA02W-C00	7615383.91	723948.8424	45° 37.773'	122° 47.629'	
11/19/2007	12:00	GCA01E-5a	1	15	--						
11/19/2007	12:06	GCA01E-6a	1	15	--						
11/19/2007	9:43	GCA02W-1c	5	13	4	LW3-GCA03W-C00	7615716.204	718146.6491	45° 36.820'	122° 47.512'	* was originally labeled as GCA03W-3a, input error on boat
11/19/2007	9:55	GCA02W-2a	1	14	--						
11/19/2007	10:02	GCA02W-3a	1	16.5	--						
11/19/2007	10:10	GCA02W-4a	1	13	2.5	LW3-GCA04W-C00	7616909.757	715211.2	45° 36.343'	122° 47.213'	
11/19/2007	10:20	GCA02w-5a	1	12	--						
11/19/2007	10:27	GCA02W-6a	1	--	6.5						
11/21/2007	10:57	GCA03W-1a	1	15	8	LW3-GCA04W-C00	7616909.757	715211.2	45° 36.343'	122° 47.213'	
11/21/2007	11:02	GCA03W-2a	1	17	15						
11/21/2007	11:07	GCA03W-3a	1	17	8						
11/21/2007	11:12	GCA03W-4a*	1	17	16	LW3-GCA04W-C00	7616909.757	715211.2	45° 36.343'	122° 47.213'	
11/21/2007	11:28	GCA03W-5c	3	17	17						
11/21/2007	11:38	GCA03W-6b	2	17	17						
11/19/2007	13:50	GCA04W-1f	6	16	34	LW3-GCA04W-C00	7616909.757	715211.2	45° 36.343'	122° 47.213'	
11/19/2007	14:00	GCA04W-2a	1	12	33						
11/19/2007	14:15	GCA04W-3c	3	14	34						
11/19/2007	14:22	GCA04W-4a	1	13	8	LW3-GCA04W-C00	7616909.757	715211.2	45° 36.343'	122° 47.213'	
11/19/2007	14:39	GCA04W-5d	4	13	6						
11/19/2007	14:48	GCA04W-6a	1	16	6						

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Table 3-6. Individual and Composite Collocated Sediment Grab Samples.

Date	Time	Station ID	Grab No.	Grab Penetration Depth (cm)	Water Depth (ft) *	Composite Sample ID ^b	Sample Location ^c		Sample Location ^c		Comments
							NAD 1983, Oregon North		NAD 1983, Decimal Minutes		
							X-Easting	Y-Northing	Lat	Long	
11/19/2007	15:20	GCA05E-1a	1	12	--						
11/19/2007	15:27	GCA05E-2a	1	13	21						
11/19/2007	15:33	GCA05E-3a	1	14	22						
11/19/2007	15:43	GCA05E-4b	2	14	16	LW3-GCA05E-C00	7621688.897	709195.8952	45° 35.375'	122° 46.053'	
11/19/2007	15:49	GCA05E-5a	1	12	8						
11/19/2007	16:18	GCA05E-6o	15	12	15						
11/21/2007	9:15	GCA05W-1b	2	17	31						
11/21/2007	9:28	GCA05W-2b	2	17	51						
11/21/2007	9:34	GCA05w-3a	1	17	25						
11/21/2007	9:47	GCA05W-4b	2	17	48	LW3-GCA05W-C00	7621559.876	707801.2078	45° 35.145'	122° 46.074'	
11/21/2007	9:52	GCA05W-5a	1	17	43						
11/21/2007	10:01	GCA05W-6c	3	12	30						
11/21/2007	10:17	GCA05W-7c	5	16	30						
11/20/2007	14:10	GCA10W-1c	5	17	48						
11/20/2007	14:30	GCA10W-2c	5	16	40						
11/20/2007	14:35	GCA10W-3a	1	12	35						
11/20/2007	14:40	GCA10W-4a	1	13	35	LW3-GCA10W-C00	7639562.76	692895.1255	45° 32.775'	122° 41.762'	
11/20/2007	14:46	GCA10W-5a	1	14	30						
11/20/2007	14:50	GCA10W-6a	1	13	21						
11/20/2007	14:59	GCA10W-7b	2	14	32						
12/6/2007	13:47	GCA11E-1-G1	1	20	49						
12/6/2007	14:26	GCA11E-2-G3	3	16	49						
12/6/2007	14:41	GCA11E-3-G1	1	24	49	LW3-GCA11E-C00 ^d	7644252.526	689225.7872	45° 32.192'	122° 40.641'	
12/6/2007	14:56	GCA11E-4-G1	1	20	50						
12/6/2007	15:08	GCA11E-5-G1	1	17	49						
12/6/2007	16:20	GCA12E-1-G1	1	28	29						
12/6/2007	16:42	GCA12E-2-G1	1	26	23	LW3-GCA12E-C00-R ^d	7646963.105	685656.6646	45° 31.617'	122° 39.984'	
12/6/2007	17:45	GCA12E-3-G4	4	18	--						
11/20/2007	12:08	GCA12W-1a	1	15	54						
11/20/2007	12:15	GCA12W-2a	1	14	55						
11/20/2007	12:22	GCA12W-3a	1	13	54						
11/20/2007	12:29	GCA12W-4a	1	13	53	LW3-GCA12W-C00	7645730.539	685966.7696	45° 31.663'	122° 40.274'	
11/20/2007	12:38	GCA12W-5b	2	13	49						
11/20/2007	13:00	GCA12W-6g	7	14	48						

Notes:

^a -- = Water depths and/or penetration depths were not recorded.

^b The composite sample consists of equal sediment volumes from individual grabs at each station.

^c Coordinates for the final composite sample are the average of the coordinates from individual grabs at each station.

^d A hydraulic power grab sampler was used at this station instead of a van Veen grab.

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Table 3-7a. Subcontractor Participants in Sampling and Sample Processing Efforts.

Subcontractors	Initials Used in Report/Field Notebooks
Benthic LLC	
Frank Tangen	FT
Ellis Ecological Services	
Belus Schoneck	BS
Doug Dysart	DDy
Peter Kaczynski	PK
Robert Ellis	BEI
Marine Endeavors LLC	
John Harrie	JH
Par Delvin	PD
Marine Sampling Systems	
Dale Dickinson	DDic
Mullins Guide Service	
Dave Mullins	DM
Oregon Bass and Panfish Club	
Bill Egan	BEg
Bob Judkins	BJ
Bud Hartman	BH
Mike Clardy	MC
Tom Nelson	TN
SWCA Environmental Services	
Jonas Moiel	JMoi
Jordan Gold	JG
Kathleen Williamson	KW
Kim Gould	KG
Kurt Ingeman	KI
Steve Johnson	SJ
Steve Novotny	SN

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Table 3-7b. LWG Consultant Participants in Sampling and Sample Processing Efforts.

Consultants	Initials Used in Report/Field Notebooks
Integral Consulting Inc	
Adam Bonin	AB
Brian Pointer	BP
David Mixon	DM
Ian Stupakoff	IS
Jane Sund	JS
Jennifer Schmitz	JSch
Jonathan Reeve	JR
Joss Moore	JM
Manon Tanner	MT
Matt Behum	MB
Stefan Wodzicki	SW
Kennedy/Jenks Consultants	
Cindy Ryals	CR
Rebecca Brosnan	RB
Tom Pinit	TP
Windward Environmental LLC	
Angelita Rodriquez	AR
Chelsea Lorenz	CL
Daniel Diedrich	DD
Emily Duffield	ED
Helle Andersen	HA
Katheleen Hurley	KH
Matt Luxon	ML
Sarah Fowler	SF
Shannon Pierce	SP
Suzanne Replinger	SR
Thai Do	TD

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Table 3-8. General Tow Information for the Collection of Clam Tissues with a Benthic Sledge.

Date	Time	Station	Tow #	Depth (ft)	Tow line out (ft)	Tow Scope	Tow duration (seconds)	Estimated Total biomass (g)	Total # of clams per tow	Composite Sample Code	Comments
11/14/2007	12:07	CA01E	1	4	16	0.25	60	16.57	21	LW3-CA01E-C00	
11/14/2007	12:16	CA01E	2	6	24	0.25	55	3.97	14	LW3-CA01E-C00	
11/14/2007	12:25	CA01E	3	6	24	0.25	55	0.39	5	LW3-CA01E-C00	
11/14/2007	12:32	CA01E	4	3	12	0.25	60	3.37	10	LW3-CA01E-C00	
11/14/2007	12:43	CA01E	5	10	40	0.25	60	8.92	10	LW3-CA01E-C00 and LW3-CA01E-C00D	
11/14/2007	12:51	CA01E	6	10	40	0.25	60	25.81	40	LW3-CA01E-C00 and LW3-CA01E-C00D	
11/14/2007	12:58	CA01E	7	10	40	0.25	60	28.39	28	LW3-CA01E-C00 and LW3-CA01E-C00D	
11/14/2007	13:06	CA01E	8	10	40	0.25	60	3.53	10	LW3-CA01E-C00 and LW3-CA01E-C00D	
11/14/2007	13:15	CA01E	9	10	40	0.25	50	18.69	23	LW3-CA01E-C00 and LW3-CA01E-C00D	Boat trailed off the path near end of tow, due to sledge acting as an anchor.
11/14/2007	13:25	CA01E	10	10	40	0.25	50	18.92	23	LW3-CA01E-C00 and LW3-CA01E-C00D	Boat trailed off the path near end of tow, due to sledge acting as an anchor.
11/14/2007	13:34	CA01E	11	10	40	0.25	55	9.86	5	LW3-CA01E-C00 and LW3-CA01E-C00D	Boat trailed off the path near end of tow, due to sledge acting as an anchor.
11/14/2007	13:41	CA01E	12	10	40	0.25	60	15.15	14	LW3-CA01E-C00 and LW3-CA01E-C00D	
11/14/2007	14:00	CA01E	13	10	40	0.25	60	19.92	11	LW3-CA01E-C00 and LW3-CA01E-C00D	
11/14/2007	14:10	CA01E	14	6	24	0.25	60	1.24	11	LW3-CA01E-C00 and LW3-CA01E-C00D	
11/14/2007	14:15	CA01E	15	6	24	0.25	70	5.99	15	LW3-CA01E-C00 and LW3-CA01E-C00D	
11/14/2007	8:29	CA02W	1	20	80	0.25	60	0.22	3	LW3-CA02W-C00 and LW3-CA02W-C00D	
11/14/2007	8:38	CA02W	2	20	80	0.25	60	3.16	2	LW3-CA02W-C00 and LW3-CA02W-C00D	
11/14/2007	8:46	CA02W	3	22	88	0.25	60	0.18	2	LW3-CA02W-C00 and LW3-CA02W-C00D	
11/14/2007	8:54	CA02W	4	19	76	0.25	60	0.52	4	LW3-CA02W-C00 and LW3-CA02W-C00D	
11/14/2007	9:04	CA02W	5	17	68	0.25	60	1.60	2	LW3-CA02W-C00 and LW3-CA02W-C00D	
11/14/2007	9:10	CA02W	6	5	20	0.25	35	33.44	13	LW3-CA02W-C00 and LW3-CA02W-C00D	Snagged on bottom.
11/14/2007	9:17	CA02W	7	6	24	0.25	55	--	0		No sample
11/14/2007	9:25	CA02W	8	7	28	0.25	45	15.76	7	LW3-CA02W-C00 and LW3-CA02W-C00D	Boat moved off course near end of tow but sampler still went straight along tow path
11/14/2007	9:34	CA02W	9	6	24	0.25	30	9.16	16	LW3-CA02W-C00 and LW3-CA02W-C00D	
11/14/2007	9:51	CA02W	10	6	24	0.25	35	2.73	12	LW3-CA02W-C00 and LW3-CA02W-C00D	
11/14/2007	9:59	CA02W	11	6	24	0.25	60	2.87	5	LW3-CA02W-C00 and LW3-CA02W-C00D	
11/14/2007	10:07	CA02W	12	7	28	0.25	40	6.08	12	LW3-CA02W-C00 and LW3-CA02W-C00D	
11/14/2007	10:17	CA02W	13	7	28	0.25	45	3.42	1	LW3-CA02W-C00 and LW3-CA02W-C00D	
11/14/2007	10:25	CA02W	14	6	24	0.25	40	4.71	5	LW3-CA02W-C00 and LW3-CA02W-C00D	
11/14/2007	10:32	CA02W	15	5	20	0.25	5	--	0		No sample .
11/14/2007	10:36	CA02W	16	9	36	0.25	40	8.28	3	LW3-CA02W-C00 and LW3-CA02W-C00D	
11/13/2007	15:24	CA03W	1	15	60	0.25	60	2.91	3	LW3-CA03W-C00	
11/13/2007	15:31	CA03W	2	15	60	0.25	60	1.55	1	LW3-CA03W-C00	
11/13/2007	15:41	CA03W	3	15	60	0.25	60	3.37	2	LW3-CA03W-C00	
11/13/2007	15:52	CA03W	4	15	60	0.25	17	3.34	2	LW3-CA03W-C00	Sampler snagged on something.
11/13/2007	16:01	CA03W	5	15	60	0.25	60	--	0		No sample
11/13/2007	16:13	CA03W	6	10	40	0.25	60	1.25	1	LW3-CA03W-C00	
11/13/2007	16:20	CA03W	7	15	60	0.25	60	2.88	3	LW3-CA03W-C00	
11/13/2007	16:29	CA03W	8	18	72	0.25	50	0.98	1	LW3-CA03W-C00	
11/13/2007	16:36	CA03W	9	5	20	0.25	60	2.53	1	LW3-CA03W-C00	
11/13/2007	16:44	CA03W	10	7	28	0.25	60	4.47	2	LW3-CA03W-C00	
11/13/2007	16:54	CA03W	11	20	80	0.25	40	1.06	1	LW3-CA03W-C00	
11/13/2007	17:06	CA03W	12	10	40	0.25	60	1.96	2	LW3-CA03W-C00	
11/14/2007	7:42	CA03W	13	10	40	0.25	60	--	0		No sample
11/14/2007	7:50	CA03W	14	10	40	0.25	60	--	0		No sample
11/14/2007	7:57	CA03W	15	5	20	0.25	60	4.66	2	LW3-CA03W-C00	
11/16/2007	16:08	CA03W	16	15	60	0.25	60	0.31	1	LW3-CA03W-C00	

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Table 3-8. General Tow Information for the Collection of Clam Tissues with a Benthic Sledge.

Date	Time	Station	Tow #	Depth (ft)	Tow line out (ft)	Tow Scope	Tow duration (seconds)	Estimated Total biomass (g)	Total # of clams per tow	Composite Sample Code	Comments
11/16/2007	16:16	CA03W	17	15	60	0.25	60	6.87	4	LW3-CA03W-C00	
11/16/2007	16:22	CA03W	18	15	60	0.25	50	1.93	2	LW3-CA03W-C00	
11/13/2007	12:29	CA04W	1	5	20	0.25	60	--	0		No sample
11/13/2007	12:34	CA04W	2	10	40	0.25	50	0.81	1	LW3-CA04W-C00	
11/13/2007	12:47	CA04W	3	35	140	0.25	40	6.52	3	LW3-CA04W-C00	
11/13/2007	12:58	CA04W	4	10	40	0.25	40	6.24	5	LW3-CA04W-C00	
11/13/2007	13:09	CA04W	5	25	100	0.25	50	--	0		No sample
11/13/2007	13:19	CA04W	6	10	40	0.25	50	1.78	1	LW3-CA04W-C00	
11/13/2007	13:30	CA04W	7	15	60	0.25	40	--	0		No sample
11/13/2007	13:35	CA04W	8	33	132	0.25	60	--	0		No sample
11/13/2007	13:53	CA04W	9	10	40	0.25	60	0.89	1	LW3-CA04W-C00	
11/13/2007	14:02	CA04W	10	10	40	0.25	60	--	0		No sample
11/13/2007	14:20	CA04W	11	10	40	0.25	50	1.25	1	LW3-CA04W-C00	
11/13/2007	14:30	CA04W	12	10	40	0.25	55	7.01	4	LW3-CA04W-C00	
11/13/2007	14:37	CA04W	13	10	40	0.25	45	--	0		No sample
11/13/2007	14:45	CA04W	14	5	20	0.25	50	--	0		No sample
11/13/2007	14:54	CA04W	15	10	40	0.25	55	3.57	2	LW3-CA04W-C00	
11/13/2007	15:01	CA04W	16	30	120	0.25	60	7.84	6	LW3-CA04W-C00	
11/14/2007	15:32	CA05E	1	20	80	0.25	60	2.75	2	LW3-CA05E-C00	
11/14/2007	15:41	CA05E	2	20	80	0.25	65	6.37	3	LW3-CA05E-C00	
11/14/2007	15:51	CA05E	3	24	96	0.25	60	3.82	2	LW3-CA05E-C00	
11/14/2007	15:59	CA05E	4	21	84	0.25	60	3.22	2	LW3-CA05E-C00	
11/14/2007	16:09	CA05E	5	25	100	0.25	60	--	0		No sample
11/14/2007	16:18	CA05E	6	22	88	0.25	50	5.82	4	LW3-CA05E-C00	
11/14/2007	16:25	CA05E	7	15	60	0.25	45	2.40	2	LW3-CA05E-C00	
11/14/2007	16:33	CA05E	8	10	40	0.25	50	5.61	5	LW3-CA05E-C00	
11/14/2007	16:39	CA05E	9	10	40	0.25	60	8.91	5	LW3-CA05E-C00	
11/14/2007	16:51	CA05E	10	22	88	0.25	40	3.98	2	LW3-CA05E-C00	
11/15/2007	16:06	CA05E	11	15	60	0.25	40	14.86	11	LW3-CA05E-C00	
11/15/2007	16:12	CA05E	12	15	60	0.25	45	0.87	5	LW3-CA05E-C00	
11/15/2007	16:20	CA05E	13	28	112	0.25	60	3.58	3	LW3-CA05E-C00	
11/15/2007	16:26	CA05E	14	15	60	0.25	60	4.66	3	LW3-CA05E-C00	
11/15/2007	16:36	CA05E	15	15	60	0.25	50	6.41	4	LW3-CA05E-C00	
11/12/2007	8:57	CA05W	1	40	160	0.25	60	8.88	6	LW3-CA05W-C00	
11/12/2007	9:14	CA05W	2	40	160	0.25	60	0.81	1	LW3-CA05W-C00	
11/12/2007	9:28	CA05W	3	45	180	0.25	60	--	0		Sampler lost on bottom of river.
11/13/2007	8:08	CA05W	4	46	184	0.25	60	2.87	2	LW3-CA05W-C00	
11/13/2007	8:23	CA05W	5	42	168	0.25	10	--	0		No sample
11/13/2007	8:32	CA05W	6a	44	176	0.25	60	--	0		No sample
11/13/2007	8:53	CA05W	7	44	176	0.25	70	4.16	2	LW3-CA05W-C00	
11/13/2007	9:05	CA05W	8	44	176	0.25	60	0.89	1	LW3-CA05W-C00	
11/13/2007	9:16	CA05W	9	30	120	0.25	60	--	0		No sample
11/13/2007	9:26	CA05W	10	25	100	0.25	60	--	0		No sample
11/13/2007	9:28	CA05W	11	40	160	0.25	10	--	0		No sample
11/13/2007	9:47	CA05W	12	40	160	0.25	60	2.01	2	LW3-CA05W-C00	
11/13/2007	9:55	CA05W	13	45	180	0.25	25	3.12	5	LW3-CA05W-C00	
11/13/2007	11:28	CA05W	14	40	160	0.25	50	--	0		No sample

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Table 3-8. General Tow Information for the Collection of Clam Tissues with a Benthic Sledge.

Date	Time	Station	Tow #	Depth (ft)	Tow line out (ft)	Tow Scope	Tow duration (seconds)	Estimated Total biomass (g)	Total # of clams per tow	Composite Sample Code	Comments
11/13/2007	11:39	CA05W	15	25	100	0.25	50	0.98	2	LW3-CA05W-C00	
11/13/2007	11:49	CA05W	16	40	160	0.25	60	--	0		No sample
11/13/2007	11:59	CA05W	17	45	180	0.25	60	2.14	1	LW3-CA05W-C00	
11/16/2007	15:00	CA05W	18	25	100	0.25	60	--	0		No sample
11/16/2007	15:09	CA05W	19	25	100	0.25	60	2.53	1	LW3-CA05W-C00	
11/16/2007	15:15	CA05W	20	32	128	0.25	60	--	0		No sample
11/16/2007	15:20	CA05W	21	30	120	0.25	50	3.90	2	LW3-CA05W-C00	
11/16/2007	15:27	CA05W	22	30	120	0.25	60	--	0		No sample
11/16/2007	15:33	CA05W	23	30	120	0.25	60	2.94	2	LW3-CA05W-C00	
11/16/2007	15:40	CA05W	24	30	120	0.25	60	3.44	2	LW3-CA05W-C00	
11/16/2007	12:19	CA10W	1	25	100	0.25	40	6.05	3	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/16/2007	12:24	CA10W	2	26	104	0.25	60	8.04	4	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/16/2007	12:36	CA10W	3	25	100	0.25	60	11.68	5	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/16/2007	12:44	CA10W	4	28	112	0.25	60	10.13	7	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/16/2007	12:52	CA10W	5	20	80	0.25	60	2.90	2	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/16/2007	13:03	CA10W	6	40	160	0.25	40	2.01	1	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/16/2007	13:14	CA10W	7	30	120	0.25	30	--	0		No sample
11/16/2007	13:19	CA10W	8	30	120	0.25	60	4.70	2	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/16/2007	13:27	CA10W	9	30	120	0.25	60	7.27	4	LW3-CA10W-C00 and LW3-CA10W-C00D	GPS recorded as 05W-09, altered in edited shapefile.
11/16/2007	13:34	CA10W	10	30	120	0.25	55	0.60	1	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/16/2007	13:42	CA10W	11	30	120	0.25	60	6.16	3	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/16/2007	13:49	CA10W	12	30	120	0.25	50	7.93	5	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/16/2007	13:59	CA10W	13	30	120	0.25	60	5.73	3	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/16/2007	14:07	CA10W	14	30	120	0.25	60	6.03	4	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/16/2007	14:14	CA10W	15	30	120	0.25	60	3.84	2	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/16/2007	14:23	CA10W	16	30	120	0.25	60	4.76	3	LW3-CA10W-C00 and LW3-CA10W-C00D	
11/15/2007	8:11	CA11E	1	47	188	0.25	60	46.38	28	LW3-CA11E-C00 and LW3-CA11E-C00D	
11/15/2007	8:22	CA11E	2	47	188	0.25	40	7.82	5	LW3-CA11E-C00 and LW3-CA11E-C00D	
11/15/2007	8:31	CA11E	3	47	188	0.25	60	15.56	9	LW3-CA11E-C00 and LW3-CA11E-C00D	
11/15/2007	8:38	CA11E	4	45	180	0.25	25	6.86	6	LW3-CA11E-C00 and LW3-CA11E-C00D	
11/15/2007	8:48	CA11E	5	45	180	0.25	60	17.36	11	LW3-CA11E-C00 and LW3-CA11E-C00D	
11/15/2007	8:56	CA11E	6	20	80	0.25	55	0.40	2	LW3-CA11E-C00 and LW3-CA11E-C00D	
11/15/2007	9:04	CA11E	7	45	180	0.25	60	0.15	1	LW3-CA11E-C00 and LW3-CA11E-C00D	
11/15/2007	9:13	CA11E	8	45	180	0.25	60	--	0		No sample
11/15/2007	9:19	CA11E	9	45	180	0.25	60	33.56	17	LW3-CA11E-C00 and LW3-CA11E-C00D	
11/15/2007	9:27	CA11E	10	45	180	0.25	60	17.23	10	LW3-CA11E-C00 and LW3-CA11E-C00D	
11/15/2007	9:54	CA11E	11	56	188	0.30	60	4.37	3	LW3-CA11E-C00 and LW3-CA11E-C00D	Max line out is 188 ft.
11/15/2007	12:02	CA12E	1	30	120	0.25	60	--	0		No sample
11/15/2007	12:10	CA12E	2	20	80	0.25	50	0.53	1	LW3-CA12E-C00 and LW3-CA12E-C00D	
11/15/2007	12:20	CA12E	3	20	80	0.25	45	--	0		No sample
11/15/2007	12:36	CA12E	4	20	80	0.25	55	11.82	6	LW3-CA12E-C00 and LW3-CA12E-C00D	
11/15/2007	12:49	CA12E	5	24	96	0.25	60	0.22	1	LW3-CA12E-C00 and LW3-CA12E-C00D	
11/15/2007	12:58	CA12E	6	25	100	0.25	60	--	0		No sample
11/15/2007	13:05	CA12E	7	20	80	0.25	10	--	0		No sample
11/15/2007	13:09	CA12E	8	22	88	0.25	8	--	0		No sample
11/15/2007	13:15	CA12E	9	25	100	0.25	18	--	0		No sample
11/15/2007	13:27	CA12E	10	25	100	0.25	60	4.11	3	LW3-CA12E-C00 and LW3-CA12E-C00D	

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Table 3-8. General Tow Information for the Collection of Clam Tissues with a Benthic Sledge.

Date	Time	Station	Tow #	Depth (ft)	Tow line out (ft)	Tow Scope	Tow duration (seconds)	Estimated Total biomass (g)	Total # of clams per tow	Composite Sample Code	Comments
11/15/2007	13:36	CA12E	11	25	100	0.25	60	--	0		No sample
11/15/2007	13:45	CA12E	12	30	120	0.25	20	--	0		No sample
11/15/2007	13:50	CA12E	13	15	60	0.25	40	14.63	11	LW3-CA12E-C00 and LW3-CA12E-C00D	
11/15/2007	14:02	CA12E	14	20	80	0.25	45	9.96	8	LW3-CA12E-C00 and LW3-CA12E-C00D	
11/15/2007	14:16	CA12E	15	25	100	0.25	45	26.98	17	LW3-CA12E-C00 and LW3-CA12E-C00D	
11/15/2007	14:55	CA12E	16	25	100	0.25	35	18.46	13	LW3-CA12E-C00 and LW3-CA12E-C00D	
11/15/2007	15:04	CA12E	17	25	100	0.25	45	10.13	6	LW3-CA12E-C00 and LW3-CA12E-C00D	
11/15/2007	15:13	CA12E	18	24	96	0.25	60	8.63	9	LW3-CA12E-C00 and LW3-CA12E-C00D	
11/15/2007	15:22	CA12E	19	25	100	0.25	50	5.28	3	LW3-CA12E-C00 and LW3-CA12E-C00D	
11/15/2007	10:47	CA12W	1	9	36	0.25	60	0.41	1		This clam was not included in final composite
11/15/2007	11:09	CA12W	2	50	188	0.27	30	--	0		Max line out is 188 ft.
11/16/2007	8:12	CA12W	3	12	48	0.25	50	--	0		No sample
11/16/2007	8:17	CA12W	4	10	40	0.25	50	--	0		No sample
11/16/2007	8:26	CA12W	5	5	20	0.25	60	--	0		No sample
11/16/2007	8:31	CA12W	6	7	28	0.25	60	--	0		No sample
11/16/2007	8:40	CA12W	7	6	24	0.25	60	--	0		No sample
11/16/2007	8:46	CA12W	8	12	48	0.25	50	--	0		No sample
11/16/2007	8:49	CA12W	9	15	60	0.25	20	--	0		No sample
11/16/2007	8:56	CA12W	10	10	40	0.25	45	--	0		No sample
11/16/2007	9:03	CA12W	11	30	120	0.25	20	--	0		No sample
11/16/2007	9:07	CA12W	12	8	32	0.25	55	--	0		No sample
11/16/2007	9:33	CA12W	13	48	185	0.26	55	3.79	5	LW3-CA12W-C00	185 ft is max amt of line we can let out.
11/16/2007	9:44	CA12W	14	47	185	0.25	60	5.80	7	LW3-CA12W-C00	
11/16/2007	10:01	CA12W	15	48	185	0.26	20	0.98	2	LW3-CA12W-C00	
11/16/2007	10:08	CA12W	16	48	185	0.26	60	0.59	5	LW3-CA12W-C00	
11/16/2007	10:14	CA12W	17	49	185	0.26	60	1.17	5	LW3-CA12W-C00	
11/16/2007	10:22	CA12W	18	48	185	0.26	60	1.23	7	LW3-CA12W-C00	
11/16/2007	10:31	CA12W	19	48	185	0.26	20	--	0		No sample
11/16/2007	10:38	CA12W	20	48	185	0.26	60	--	0		No sample
11/16/2007	10:43	CA12W	21	48	185	0.26	60	1.06	1	LW3-CA12W-C00	
11/16/2007	10:51	CA12W	22	48	185	0.26	60	6.64	9	LW3-CA12W-C00	
11/16/2007	11:00	CA12W	23	48	185	0.26	60	4.70	5	LW3-CA12W-C00	
11/16/2007	11:08	CA12W	24	48	185	0.26	60	0.98	1	LW3-CA12W-C00	
11/16/2007	11:13	CA12W	25	49	185	0.26	60	1.86	3	LW3-CA12W-C00	
11/16/2007	11:23	CA12W	26	49	185	0.26	60	1.34	3	LW3-CA12W-C00	
11/16/2007	11:31	CA12W	27	49	185	0.26	60	1.15	2	LW3-CA12W-C00	
11/16/2007	11:36	CA12W	28	49	185	0.26	5	--	0		No sample
11/16/2007	11:42	CA12W	29	49	185	0.26	60	--	0		No sample

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Table 3-9. Summary of Samples, Field QC Samples, and Analyses.

Sample Type/Analysis	Samples	Field Replicates ^a	Post-Homogenization Sample Splits ^b	Equipment Blanks ^c	Total Number of Samples ^d
Smallmouth Bass					
Body Carcass					
Butyltins	18	--	1	1	20
Dioxin/furans	18	--	1	1	20
Lipids	18	--	1	--	19
Metals ^e	18	--	1	1	20
PAHs	18	--	1	1	20
PCB congeners	18	--	1	1	20
Pesticides	18	--	1	1	20
SVOCs ^f	18	--	1	1	20
Fillet					
Butyltins	18	--	1	1	20
Dioxin/furans	18	--	1	1	20
Lipids	18	--	1	--	19
Metals ^e	18	--	1	1	20
PAHs	18	--	1	1	20
PCB congeners	18	--	1	1	20
Pesticides	18	--	1	1	20
SVOCs ^f	18	--	1	1	20
Carp					
Body Carcass					
Butyltins	9	--	1	1	11
Dioxin/furans	9	--	1	1	11
Lipids	9	--	1	--	10
Metals ^e	9	--	1	1	11
PAHs	9	--	1	1	11
PCB congeners	9	--	1	1	11
Pesticides	9	--	1	1	11
SVOCs ^f	9	--	1	1	11
Fillet					
Butyltins	9	--	1	1	11
Dioxin/furans	9	--	1	1	11
Lipids	9	--	1	--	10
Metals ^e	9	--	1	1	11
PAHs	9	--	1	1	11
PCB congeners	9	--	1	1	11
Pesticides	9	--	1	1	11
SVOCs ^f	9	--	1	1	11

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Table 3-9. Summary of Samples, Field QC Samples, and Analyses.

Sample Type/Analysis	Samples	Field Replicates ^a	Post-Homogenization Sample Splits ^b	Equipment Blanks ^c	Total Number of Samples ^d
Crayfish					
Whole-body Tissue					
Butyltins	9	--	1	1	11
Dioxin/furans	9	--	1	1	11
Lipids	9	--	1	--	10
Metals ^c	9	--	1	1	11
PAHs	9	--	1	1	11
PCB congeners	9	--	1	1	11
Pesticides	9	--	1	1	11
SVOCs ^f	9	--	1	1	11
Sculpin					
Whole-body Tissue					
Butyltins	16	--	1	1	18
Dioxin/furans	16	--	1	1	18
Lipids	16	--	1	--	17
Metals ^c	16	--	1	1	18
PAHs	16	--	1	1	18
PCB congeners	16	--	1	1	18
Pesticides	16	--	1	1	18
SVOCs ^f	16	--	1	1	18
Clam					
Tissue (shucked soft tissue)					
Butyltins	14	--	--	1	15
Dioxin/furans	15	--	--	1	16
Lipids	15	--	--	--	15
Metals ^c	15	--	--	1	16
PAHs	15	--	--	1	16
Alkylated PAHs	15	--	--	1	16
PCB congeners	15	--	--	1	16
Pesticides	15	--	--	1	16
SVOCs ^f	14	--	--	1	15

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Table 3-9. Summary of Samples, Field QC Samples, and Analyses.

Sample Type/Analysis	Samples	Field Replicates ^a	Post-Homogenization Sample Splits ^b	Equipment Blanks ^c	Total Number of Samples ^d
Collocated Sediments					
Crayfish/Sculpin					
Butyltins	20	1	--	1	22
Dioxin/furans	20	1	--	1	22
Grain size	20	1	--	--	21
Metals ^e	20	1	--	1	22
PAHs	20	1	--	--	21
Alkylated PAHs	20	1	--	--	21
PCB Aroclors	20	1	--	--	21
PCB congeners	20	1	--	1	22
Pesticides	20	1	--	1	22
SVOCs ^f	20	1	--	1	22
TOC	20	1	--	--	21
Total solids	20	1	--	--	21
Clam					
Butyltins	10	1	--	1	12
Dioxin/furans	10	1	--	1	12
Grain size	10	1	--	--	11
Metals ^e	10	1	--	1	12
PAHs	10	1	--	1	12
Alkylated PAHs	10	1	--	1	12
PCB Aroclors	10	1	--	1	12
PCB congeners	10	1	--	1	12
Pesticides	10	1	--	1	12
SVOCs ^f	10	1	--	1	12
TOC	10	1	--	--	11
Total solids	10	1	--	--	11

Notes:

^a Field replicates were collected for at least 5% of the total number of collocated sediment samples.

^b Post-homogenization splits were collected at a frequency of at least 5% of the total number of tissue samples per species.

^c Equipment rinsate blanks were collected for at least 5% of the total number of samples.

^d Total number of samples includes laboratory QA/QC samples.

^e Includes mercury.

^f Includes phenols and phthalate esters.

PAHs - polycyclic aromatic hydrocarbons

PCB - polychlorinated biphenyl

SVOCs - semivolatile organic compounds

TOC - total organic carbon

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Table 4-1a. Analytical Summary Table for Composite Tissue Samples.

Station ID	Sample ID	Tissue Type	Total Homogenized Weight (g)	Axys Aliquot (g)	CAS Aliquot (g)	EPA Aliquot (g)	Analyses							
							Axys	CAS						
								PCB congeners, PCDD/Fs, pesticides, lipids	Metals and Solids	Butyltins	PAHs	Alkylated PAHs	SVOCs ^d	Archival
Bait														
--	LW3-CRBAIT-SHAD	Shad	247.1	170.0	77.1	--	X	X	X	X		X	X	
--	LW3-CRBAIT-SMELT	Smelt	145.7	95.7	50.0	--	X	X	X	X		X	X	
--	LW3-SPBAIT-WORM	Worms	315.1	170.0	145.1	--	X	X	X	X		X	X	
--	LW3-CPBAIT-CORN	Corn	269.7	170.0	99.7	--	X	X	X	X		X	X	
Smallmouth Bass														
SB02E	LW3-SB02E-C00F	Fillet	474.9	200	254.9	20	X	X	X	X		X	X	
SB02E	LW3-SB02E-C00B	Body	1010.2	200	790.2	20	X	X	X	X		X	X	
SB03E	LW3-SB03E-C00F	Fillet	421.3	200	201.3	20	X	X	X	X		X	X	
SB03E	LW3-SB03E-C00B	Body	1114.7	200	894.7	20	X	X	X	X		X	X	
SB03W	LW3-SB03W-C00F	Fillet	394.0	200	174.0	20	X	X	X	X		X	X	
SB03W	LW3-SB03W-C00B	Body	1194.6	200	974.6	20	X	X	X	X		X	X	
SB04E	LW3-SB04E-C01F ^a	Fillet	781.0	200	170.5	20	X	X	X	X		X	X	
SB04E	LW3-SB04E-C02F ^a	Fillet		200	170.5	20	X	X	X	X		X	X	
SB04E	LW3-SB04E-C01B ^a	Body	2372.7	200	966.4	20	X	X	X	X		X	X	
SB04E	LW3-SB04E-C02B ^a	Body		200	966.4	20	X	X	X	X		X	X	
SB04W	LW3-SB04W-C00F	Fillet	664.4	200	444.4	20	X	X	X	X		X	X	
SB04W	LW3-SB04W-C00B	Body	1799.2	200	1579.2	20	X	X	X	X		X	X	
SB05W	LW3-SB05W-C00F	Fillet	527.1	200	307.1	20	X	X	X	X		X	X	
SB05W	LW3-SB05W-C00B	Body	1634.7	200	1414.7	20	X	X	X	X		X	X	
SB06E	LW3-SB06E-C00F	Fillet	327.5	200	107.5	20	X	X	X	X		X	X	
SB06E	LW3-SB06E-C00B	Body	1015.2	200	795.2	20	X	X	X	X		X	X	
SB06W	LW3-SB06W-C00F	Fillet	291.8	200	71.8	20	X	X	X	X		X	X	
SB06W	LW3-SB06W-C00B	Body	922.4	200	702.4	20	X	X	X	X		X	X	
SB07E	LW3-SB07E-C00F	Fillet	679.2	200	459.2	20	X	X	X	X		X	X	
SB07E	LW3-SB07E-C00B	Body	1787.6	200	1567.6	20	X	X	X	X		X	X	
SB07W	LW3-SB07W-C00F	Fillet	474.7	200	254.7	20	X	X	X	X		X	X	
SB07W	LW3-SB07W-C00B	Body	1561.4	200	1341.4	20	X	X	X	X		X	X	
SB08E	LW3-SB08E-C00F	Fillet	511.1	200	291.1	20	X	X	X	X		X	X	
SB08E	LW3-SB08E-C00B	Body	1573.4	200	1353.4	20	X	X	X	X		X	X	
SB08W	LW3-SB08W-C00F	Fillet	468.0	200	248.0	20	X	X	X	X		X	X	
SB08W	LW3-SB08W-C00B	Body	958.4	200	738.4	20	X	X	X	X		X	X	
SB09E	LW3-SB09E-C00F	Fillet	734.6	200	514.6	20	X	X	X	X		X	X	
SB09E	LW3-SB09E-C00B	Body	1462.7	200	1242.7	20	X	X	X	X		X	X	
SB09W	LW3-SB09W-C00F	Fillet	721.2	200	501.2	20	X	X	X	X		X	X	
SB09W	LW3-SB09W-C00B	Body	1771.9	200	1551.9	20	X	X	X	X		X	X	
SB10E	LW3-SB010E-C00F	Fillet	741.2	200	321.2	20	X	X	X	X		X	X	
SB10E	LW3-SB010E-C00B	Body	1724.9	200	1304.9	20	X	X	X	X		X	X	
SB10W	LW3-SB010W-C00F	Fillet	482.7	200	262.7	20	X	X	X	X		X	X	
SB10W	LW3-SB010W-C00B	Body	1091.3	200	871.3	20	X	X	X	X		X	X	
SB11E	LW3-SB011E-C00F	Fillet	350.9	200	130.9	20	X	X	X	X		X	X	
SB11E	LW3-SB011E-C00B	Body	1150.5	200	930.5	20	X	X	X	X		X	X	
SB11W	LW3-SB011W-C00F	Fillet	469.7	200	249.7	20	X	X	X	X		X	X	
SB11W	LW3-SB011W-C00B	Body	1463.9	200	1243.9	20	X	X	X	X		X	X	

Table 4-1a. Analytical Summary Table for Composite Tissue Samples.

							Analyses						
							Axys	CAS					
								PCB congeners, PCDD/Fs, pesticides, lipids	Metals and Solids	Butyltins	PAHs	Alkylated PAHs	SVOCs ^d
Station ID	Sample ID	Tissue Type	Total Homogenized Weight (g)	Axys Aliquot (g)	CAS Aliquot (g)	EPA Aliquot (g)							
Carp													
CP0004	LW3-CP0004-C10F	Fillet	3152.3	200	2932.3	20	X	X	X	X		X	X
CP0004	LW3-CP0004-C10B	Body	9734.9	200	9514.9	20	X	X	X	X		X	X
CP0004	LW3-CP0004-C20F	Fillet	3345.9	200	3125.9	20	X	X	X	X		X	X
CP0004	LW3-CP0004-C20B	Body	9553.8	200	9333.8	20	X	X	X	X		X	X
CP0004	LW3-CP0004-C30F	Fillet	3212.2	200	2992.2	20	X	X	X	X		X	X
CP0004	LW3-CP0004-C30B	Body	9467.5	200	9247.5	20	X	X	X	X		X	X
CP0408	LW3-CP0408-C10F	Fillet	3323.1	200	3103.1	20	X	X	X	X		X	X
CP0408	LW3-CP0408-C10B	Body	9289.6	200	9069.6	20	X	X	X	X		X	X
CP0408	LW3-CP0408-C20F	Fillet	3440.9	200	3220.9	20	X	X	X	X		X	X
CP0408	LW3-CP0408-C20B	Body	8726.0	200	8506.0	20	X	X	X	X		X	X
CP0408	LW3-CP0408-C30F	Fillet	3353.1	200	3133.1	20	X	X	X	X		X	X
CP0408	LW3-CP0408-C30B	Body	9133.5	200	8913.5	20	X	X	X	X		X	X
CP0812	LW3-CP0812-C11F ^a	Fillet	4339.3	200	1947.7	20	X	X	X	X		X	X
CP0812	LW3-CP0812-C12F ^a	Body		200	4415.0	20	X	X	X	X		X	X
CP0812	LW3-CP0812-C11B ^a	Fillet	9270.0	200	1947.7	20	X	X	X	X		X	X
CP0812	LW3-CP0812-C12B ^a	Body		200	4415.0	20	X	X	X	X		X	X
CP0812	LW3-CP0812-C20F	Fillet	4096.2	400	3676.2	20	X	X	X	X		X	X
CP0812	LW3-CP0812-C20B	Body	10517.7	400	10097.7	20	X	X	X	X		X	X
CP0812	LW3-CP0812-C30F	Fillet	3237.0	200	3017.0	20	X	X	X	X		X	X
CP0812	LW3-CP0812-C30B	Body	8673.5	200	8453.5	20	X	X	X	X		X	X
Sculpin													
SP01E-ALT	LW3-SP01E-Alt-C00	Body	229.7	170.0	59.7	--	X	X	X	X		X	X
SP01W	LW3-SP01W-C00	Body	177.9	127.9	50.0	--	X	X	X	X		X	X
SP03E	LW3-SP03E-C00	Body	159.4	109.4	50.0	--	X	X	X	X		X	X
SP04W	LW3-SP04W-C00	Body	285.8	235.8	50.0	--	X	X	X	X		X	X
SP05E	LW3-SP05E-C00	Body	197.5	147.5	50.0	--	X	X	X	X		X	X
SP06W	LW3-SP06W-C00	Body	218.4	168.4	50.0	--	X	X	X	X		X	X
SP07E	LW3-SP07E-C00	Body	281.3	170.0	111.3	--	X	X	X	X		X	X
SP07W	LW3-SP07W-C00	Body	164.6	114.6	50.0	--	X	X	X	X		X	X
SP08E	LW3-SP08E-C00	Body	290.2	170.0	120.2	--	X	X	X	X		X	X
SP08W	LW3-SP08W-C00	Body	217.3	167.3	50.0	--	X	X	X	X		X	X
SP09W	LW3-SP09W-C00	Body	258.2	170.0	88.2	--	X	X	X	X		X	X
SP10E	LW3-SP10E-C00	Body	269.4	170.0	99.4	--	X	X	X	X		X	X
SP10W	LW3-SP10W-C00	Body	228.8	170.0	58.8	--	X	X	X	X		X	X
SP11E	LW3-SP11E-C00	Body	161.4	111.4	50.0	--	X	X	X	X		X	X
SP12E	LW3-SP12E-C00	Body	178.8	128.8	50.0	--	X	X	X	X		X	X
SP12W-ALT	LW3-SP12W-Alt-C01 ^a	Body	219.2	169.2	50.0	--	X	X	X	X		X	X
SP12W-ALT	LW3-SP12W-Alt-C02 ^a	Body	218.1	168.1	50.0	--	X	X	X	X		X	X
Crayfish													
CR01E-ALT	LW3-CR01E-Alt-C00	Body	331.1	150	181.1	--	X	X	X	X		X	X
CR01W	LW3-CR01W-C00	Body	413.5	150	263.5	--	X	X	X	X		X	X
CR05W	LW3-CR05W-C00	Body	341.5	150	191.5	--	X	X	X	X		X	X
CR06W	LW3-CR06W-C00	Body	384.9	150	234.9	--	X	X	X	X		X	X

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Table 4-1a. Analytical Summary Table for Composite Tissue Samples.

							Analyses						
							Axys	CAS					
								PCB congeners, PCDD/Fs, pesticides, lipids	Metals and Solids	Butyltins	PAHs	Alkylated PAHs	SVOCs ^d
Station ID	Sample ID	Tissue Type	Total Homogenized Weight (g)	Axys Aliquot (g)	CAS Aliquot (g)	EPA Aliquot (g)							
CR08W	LW3-CR08W-C00	Body	394.0	150	244.0	--	X	X	X	X		X	X
CR10W	LW3-CR10W-C00	Body	425.2	300	125.2	--	X	X	X	X		X	X
CR11E	LW3-CR11E-C01 ^a	Body	217.9	138	80.0	--	X	X	X	X		X	X
CR11E	LW3-CR11E-C02 ^a	Body	217.9	138	80.0	--	X	X	X	X		X	X
CR12E	LW3-CR12E-C00	Body	327.5	150	177.5	--	X	X	X	X		X	X
CR12W	LW3-CR12W-C00	Body	388.4	150	238.4	--	X	X	X	X		X	X
Clam													
CA01E	LW3-CA01E-C01 ^a	Body	156.9	10	126.9	20	X	X	X	X	X	X	X
CA01E	LW3-CA01E-C02 ^a	Body	30.0	10	20.0	--	X	X	X	X	X	X	X
CA01E	LW3-CA01E-C00D	Body	107.1	10	97.1	--	X	X	X	X	X	X	X
CA02W	LW3-CA02W-C00	Body	130.1	10	100.1	20	X	X	X	X	X	X	X
CA02W	LW3-CA02W-C00D	Body	27.9	10	17.9	--	X	X	X ^b	X	X	X	X
CA03W	LW3-CA03W-C00	Body	43.6	10	33.6	--	X	X	X	X	X	X	X
CA04W	LW3-CA04W-C00	Body	53.0	10	43.0	--	X	X	X	X	X	X	X
CA05E	LW3-CA05E-C00	Body	110.9	10	80.9	20	X	X	X	X	X	X	X
CA05W	LW3-CA05W-C00	Body	51.1	10	41.1	--	X	X	X	X	X	X	X
CA10W	LW3-CA10W-C00	Body	144.3	10	114.3	20	X	X	X	X	X	X	X
CA10W	LW3-CA10W-C00D	Body	17.0	10	7.0	--	X	X		X ^c	X ^c		X
CA11E	LW3-CA11E-C00	Body	124.7	10	94.7	20	X	X	X	X	X	X	X
CA11E	LW3-CA11E-C00D	Body	152.0	20	132.0	--	X	X	X	X	X	X	X
CA12E	LW3-CA12E-C00	Body	107.4	10	77.4	20	X	X	X	X	X	X	X
CA12E	LW3-CA12E-C00D	Body	60.4	10	50.4	--	X	X	X	X	X	X	X
CA12W	LW3-CA12W-C00	Body	35.6	10	25.6	--	X	X	X	X	X	X	X

Notes:

^a Post-homogenization split samples collected on SB04E (body & fillet), CP0812 (body & fillet), SP12W-Alt, CR11E, and CA01E.

^b Sample LW3-CA02W-C00D: Butyltins will have an elevated detection limit (2.91 g available for analysis instead of 5 g).

^c Sample LW3-CA10W-C00D: PAHs (parent and alkylated) will have an elevated detection limit (4.03 g available for analysis instead of 5 g).

^d Includes phenols and phthalate esters.

Table 4-1b. Analytical Summary Table for Collocated Surface Sediment Samples.

Station ID	Sample ID	Chemical Analyses										Vista
		CAS										PCB Congeners
		Metals	Butyltins	PAHs ^a	SVOCs ^b	PCB Aroclors	Dioxins	Pesticides	Grain Size	Total Solids/ Total Organic Carbon	Archival	
Crayfish/Sculpin												
GCR01E-ALT	LW3-GCR01E-AIt-C00	X	X	X	X	X	X	X	X	X	X	X
GCRSP01W	LW3-GCRSP01W-C01	X	X	X	X	X	X	X	X	X	X	X
GCR01W	LW3-GCR01W-C02	X	X	X	X	X	X	X	X	X	X	X
GCR05W	LW3-GCR05W-C00	X	X	X	X	X	X	X	X	X	X	X
GCRSP06W	LW3-GCRSP06W-C00	X	X	X	X	X	X	X	X	X	X	X
GCRSP08W	LW3-GCRSP08W-C00	X	X	X	X	X	X	X	X	X	X	X
GCR10W	LW3-GCR10W-C00	X	X	X	X	X	X	X	X	X	X	X
GCRSP11E	LW3-GCRSP11E-C00	X	X	X	X	X	X	X	X	X	X	X
GCRSP12E	LW3-GCRSP12E-C00	X	X	X	X	X	X	X	X	X	X	X
GCR12W	LW3-GCR12W-C00	X	X	X	X	X	X	X	X	X	X	X
GSP01E	LW3-GSP01E-C00	X	X	X	X	X	X	X	X	X	X	X
GSP03E	LW3-GSP03E-C00	X	X	X	X	X	X	X	X	X	X	X
GSP04W	LW3-GSP04W-C00	X	X	X	X	X	X	X	X	X	X	X
GSP05E	LW3-GSP05E-C00	X	X	X	X	X	X	X	X	X	X	X
GSP07E	LW3-GSP07E-C00	X	X	X	X	X	X	X	X	X	X	X
GSP07W	LW3-GSP07W-C00	X	X	X	X	X	X	X	X	X	X	X
GSP08E	LW3-GSP08E-C00	X	X	X	X	X	X	X	X	X	X	X
GSP09W	LW3-GSP09W-C00	X	X	X	X	X	X	X	X	X	X	X
GSP10E	LW3-GSP10E-C00	X	X	X	X	X	X	X	X	X	X	X
GSP10W	LW3-GSP10W-C00	X	X	X	X	X	X	X	X	X	X	X
GSP12W-ALT	LW3-GSP12W-AIt-C00	X	X	X	X	X	X	X	X	X	X	X
Clam												
GCA01E	LW3-GCA01E-C00	X	X	X	X	X	X	X	X	X	X	X
GCA02W	LW3-GCA02W-C01	X	X	X	X	X	X	X	X	X	X	X
GCA02W	LW3-GCA02W-C02	X	X	X	X	X	X	X	X	X	X	X
GCA03W	LW3-GCA03W-C00	X	X	X	X	X	X	X	X	X	X	X
GCA04W	LW3-GCA04W-C00	X	X	X	X	X	X	X	X	X	X	X
GCA05E	LW3-GCA05E-C00	X	X	X	X	X	X	X	X	X	X	X
GCA05W	LW3-GCA05W-C00	X	X	X	X	X	X	X	X	X	X	X
GCA10W	LW3-GCA10W-C00	X	X	X	X	X	X	X	X	X	X	X
GCA11E	LW3-GCA11E-C00	X	X	X	X	X	X	X	X	X	X	X
GCA12E	LW3-GCA12E-C00-R	X	X	X	X	X	X	X	X	X	X	X
GCA12W	LW3-GCA12W-C00	X	X	X	X	X	X	X	X	X	X	X

Notes:

^a Includes parent and alkylated PAHs.

^b Includes phenols and phthalate esters.

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Table 4-2a. Laboratory Methods for Tissue Samples.

Analysis	Laboratory	Sample Preparation		Quantitative Analysis	
		Protocol	Procedure	Protocol	Procedure
Lipids	Axys	EPA 3540C ^a	Soxhlet extraction	Axys SOP	Gravimetric
Percent moisture	CAS	--	--	CAS SOP	Gravimetric
Metals	CAS				
Aluminum, antimony, arsenic, cadmium, copper, lead, manganese, nickel, silver, thallium, zinc		EPA 3050B/PSEP 1997	Acid digestion	EPA 6020	ICP/MS
Chromium		EPA 3050B/PSEP 1997	Acid digestion	EPA 6010B	ICP/AES
Selenium		EPA 3050B/PSEP 1997	Acid digestion	EPA 7740	GFAAS
Mercury		EPA 7471A	Acid digestion/oxidation	EPA 7471A	CVAAS
Butyltin compounds	CAS	Krone et al. 1988	Solvent extraction Derivatization	Krone et al. 1988	GC/FPD
Organochlorine pesticides	Axys	Axys SOP	Soxhlet Extraction Gel permeation chromatography Acid/base silica column Florisil [®] chromatography 1% deactivated basic Alumina	Axys SOP	HRGC/HRMS
Polycyclic aromatic hydrocarbons ^b	CAS	EPA 3541 EPA 3640A EPA 3630C	Automated Soxhlet extraction Gel permeation chromatography Silica gel cleanup	EPA 8270C-SIM	GC/MS-SIM
Semivolatile organic compounds ^c	CAS	EPA 3541 EPA 3640A	Automated Soxhlet extraction Gel permeation chromatography	EPA 8270C	GC/MS

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This document is currently under review by US EPA and its federal, state, and
tribal partners, and is subject to change in whole or in part.

Table 4-2a. Laboratory Methods for Tissue Samples.

Analysis	Laboratory	Sample Preparation		Quantitative Analysis	
		Protocol	Procedure	Protocol	Procedure
Chlorinated dioxins and furans	Axys	EPA 1613B	Soxhlet extraction	EPA 1613B	HRGC/HRMS
			Gel permeation chromatography		
			Acid/base silica column		
			Florisil® chromatography		
			Carbon celite		
PCB congeners ^d	Axys	EPA 1668A	Layered silver nitrate/acid/base silica	EPA 1668A	HRGC/HRMS
			1% deactivated basic Alumina		
			Soxhlet extraction		
			Gel permeation chromatography		
			Acid/base silica column		
			Florisil® chromatography		
			1% deactivated basic Alumina		

Notes:

^a A portion of the PCB congener, pesticide, dioxin/furan extract will be used for lipids determination.

^b PAH analyses for clam tissue samples include alkylated PAHs.

^c Includes phenols and phthalate esters.

^d Analysis will be completed for all 209 PCB congeners.

Axys - Axys Analytical Services, Ltd.

CAS - Columbia Analytical Services

CVAAS - cold vapor atomic absorption spectrometry

EPA - U.S. Environmental Protection Agency

GC/FPD - gas chromatography/flame photometric detection

GC/MS - gas chromatography/mass spectrometry

GFAAS - graphite furnace atomic absorption spectrometry

HRGC/HRMS - high-resolution gas chromatography/high-resolution mass spectrometry

ICP/AES - inductively coupled plasma - atomic emission spectroscopy

ICP/MS - inductively coupled plasma - mass spectrometry

PCB - polychlorinated biphenyl

PSEP - Puget Sound Estuary Program

SIM - selected ion monitoring

SOP - Standard operating procedure

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Table 4-2b. Laboratory Methods for Collocated Sediment Samples.

Analysis	Laboratory	Sample Preparation		Quantitative Analysis	
		Protocol	Procedure	Protocol	Procedure
Conventional Analyses	CAS				
Total solids		--	--	PSEP 1986	Gravimetric
Grain size		--	--	PSEP 1986	Sieve and pipette method
Total organic carbon		Plumb 1981	Acid pretreatment	Plumb 1981	Combustion; coulometric titration
Metals	CAS				
Antimony, arsenic ^a , cadmium, lead, manganese, silver, thallium		EPA 3050	Strong acid digestion	EPA 6020	ICP/MS
		EPA 3050	Strong acid digestion	EPA 6010B	ICP/AES
Aluminum, chromium, copper, nickel, zinc		EPA 3050	Strong acid digestion	EPA 7062	AAS
Arsenic ^a		EPA 7471A	Acid digestion/oxidation	EPA 7471A	CVAAS
Mercury		EPA 3050	Strong acid digestion	EPA 7742	AAS
Selenium		EPA 7742	Hydride generation		
Butyltin compounds	CAS	Krone et al. 1988	Solvent extraction Derivatization	Krone et al. 1988	GC/FPD
Organochlorine pesticides	CAS	EPA 3541 EPA 3620B EPA 3660B	Soxhlet extraction Florisil [®] cleanup Sulfur cleanup	EPA 8081A	GC/ECD
Polycyclic aromatic hydrocarbons ^b	CAS	EPA 3541 EPA 3640A EPA 3630C	Automated Soxhlet Extraction Gel permeation chromatography Silica Gel cleanup	EPA 8270C-SIM	GC/MS-SIM
Tri-, Tetra-, and Pentachlorophenols	CAS	EPA 8151	Sonication extraction Esterification	EPA 8151	GC/MS
Semivolatile organic compounds ^c	CAS	EPA 3541 EPA 3640A	Automated Soxhlet Extraction Gel permeation chromatography	EPA 8270C	GC/MS

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Table 4-2b. Laboratory Methods for Collocated Sediment Samples.

Analysis	Laboratory	Sample Preparation		Quantitative Analysis	
		Protocol	Procedure	Protocol	Procedure
Chlorinated dioxins and furans	CAS	EPA 1613B	Soxhlet/Dean Stark extraction Sulfuric acid cleanup Silica/carbon column cleanup	EPA 1613B	HRGC/HRMS
PCB congeners ^d	Vista	EPA 1668A	Soxhlet/Dean Stark extraction Sulfuric acid cleanup Silica column cleanup	EPA 1668A	HRGC/HRMS

Notes:

^a Arsenic will be analyzed by EPA Method 7062 if it is not detected at the MRL by EPA Method 6020.

^b PAH analyses for sediment samples collocated with clam tissue include alkylated PAHs.

^c Includes phthalate esters and mono-, dichlorophenols.

^d Analysis will be completed for all 209 PCB congeners.

AAS - atomic absorption spectrometry

CAS - Columbia Analytical Services

CVAAS - cold vapor atomic absorption spectrometry

EPA - U.S. Environmental Protection Agency

GC/ECD - gas chromatography/electron capture detection

GC/FID - gas chromatography/flame ionization detection

GC/FPD - gas chromatography/flame photometric detection

GC/MS - gas chromatography/mass spectrometry

HRGC/HRMS - high-resolution gas chromatography/high-resolution mass spectrometry

ICP/AES - inductively coupled plasma/atomic emission spectrometry

NWTPH - Northwest total petroleum hydrocarbons

ICP/MS - inductively coupled plasma - mass spectrometry

PCB - polychlorinated biphenyl

PSEP - Puget Sound Estuary Program

SIM - selected ion monitoring

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PORTLAND HARBOR RI/FS

**ROUND 3B FISH AND INVERTEBRATE TISSUE
AND COLLOCATED SURFACE SEDIMENT
FIELD SAMPLING REPORT**

APPENDIX A
EPA-LWG COMMUNICATIONS

DRAFT

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February 15, 2008

Prepared for
The Lower Willamette Group

Prepared by
Integral Consulting Inc.
Windward Environmental LLC

**ROUND 3B FISH AND INVERTEBRATE TISSUE AND
COLLOCATED SURFACE SEDIMENT FIELD SAMPLING REPORT**

List of Contents

- A1: LWG. 2007. Lower Willamette Group email to EPA dated August, 9, 2007 (from I. Stupakoff to E. Blischke and J. Goulet) regarding the confirmation of sampling stations during recon trip for R3B and Invertebrate Tissue Sampling Event. Lower Willamette Group, Portland, OR.
- A2: EPA. 2007. EPA letter to Lower Willamette Group dated December 3, 2007 (from C. Humphrey and E. Blischke to J. McKenna and R. Wyatt) regarding Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240. Round 3B Field Sampling Plan for Fish and Invertebrate Tissue and Collocated Surface Sediment and Round 2 Quality Assurance Project Plan Addendum 9. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.
- A3: EPA. 2007. EPA email to Lower Willamette Group dated September 3, 2007 (from B. Shephard to J. McKenna, R. Applegate, and R. Wyatt) regarding Modification to FSP Procedure, Round 3B Biota Sampling, Portland Harbor. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.
- A4: EPA. 2007. EPA email to Lower Willamette Group dated September 4, 2007 (from B. Shephard to J. McKenna, R. Applegate, and R. Wyatt) regarding modification to FSP Fish Processing Procedure, Round 3B Biota Sampling, Portland Harbor. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.
- A5: LWG. 2007. Lower Willamette Group email to EPA dated September 26, 2007 (from J. McKenna to E. Blischke and M. Tritt) regarding sculpin sample mass requirements. Lower Willamette Group, Portland, OR.
- A6: EPA. 2007. EPA email to Lower Willamette Group dated November 26, 2007 (from E. Blischke to J. Toll) regarding tissue mass requirements for clam sampling. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.
- A7: EPA. 2007. EPA email to Lower Willamette Group dated September 27, 2007 (from E. Blischke to J. McKenna, R. Wyatt, and R. Applegate) regarding the Biota tissue sampling. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

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- A8: EPA. 2007. EPA email to Lower Willamette Group dated November 27, 2007 (from E. Blischke to R. Applegate, J. McKenna, and R. Wyatt) regarding the Round 3B clam sampling. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.
- A9: EPA. 2007. EPA email and attachment to Lower Willamette Group dated October 16, 2007 (from E. Blischke to J. Pisano) regarding EPA Notification: Table of R3B Crayfish Composites. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.
- A10: LWG. 2007. Lower Willamette Group email and attachment to EPA dated October 11, 2007 (from J. Pisano to E. Blischke, C. Humphrey, and K. Koch) regarding EPA Notification: Table of R3B Crayfish Composites. Lower Willamette Group, Portland, OR.
- A11: EPA. 2007. EPA email to Lower Willamette Group dated November 2, 2007 (from E. Blischke to J. McKenna, R. Wyatt, and R. Applegate) regarding Round 3B fish compositing. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.
- A12: EPA. 2007. EPA email and attachments to Lower Willamette Group dated November 29, 2007 (from E. Blischke to L. Kennedy) regarding Round 3B Bass and carp compositing. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.
- A13: EPA. 2007. EPA email to Lower Willamette Group dated December 12, 2007 (from E. Blischke to M. Tritt) regarding Bass composite at location SB10E. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.
- A14: LWG. 2007. Lower Willamette Group email and attachments to EPA dated October 11, 2007 (from G. Revelas to E. Blischke, C. Humphrey, and J. Goulet) regarding target Sculpin/Crayfish collocated sediment sample target locations. Lower Willamette Group, Portland, OR.
- A15: EPA. 2007. EPA email to Lower Willamette Group dated October 12, 2007 (from E. Blischke to G. Revelas) regarding target Sculpin/Crayfish collocated sediment sample target locations. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.
- A16: Collocated Sediment Stations for Clam Samples.
- A16a. EPA. 2007. EPA email and attachments to Lower Willamette Group dated November 16, 2007 (from E. Blischke to G. Revelas) regarding collocated sediment stations for clams. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

- A16b. EPA. 2007. EPA email and attachments to Lower Willamette Group dated November 18, 2007 (from J. Goulet to G. Revelas) regarding missing tow maps. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.
- A16c. EPA. 2007. EPA email and attachments to Lower Willamette Group dated November 19, 2007 (from J. Goulet to I. Stupakoff) regarding missing tow maps. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.
- A17: EPA. 2008. EPA email and attachment to Lower Willamette Group dated February 1, 2008 (from E. Blischke to M. Tritt) regarding Portland Harbor R3B Biota – Clam sample weights and analyses. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

DO NOT QUOTE OR CITE

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Appendix A1

LWG. 2007. Lower Willamette Group email to EPA dated August, 9, 2007 (from I. Stupakoff to E. Blischke and J. Goulet) regarding the Confirmation of Sampling Stations during Recon Trip for R3B and Invertebrate Tissue Sampling Event. Lower Willamette Group, Portland, OR.

From: Ian Stupakoff
Sent: Thursday, August 09, 2007 12:32 PM
To: 'Blischke.Eric@epamail.epa.gov'; Goulet.Joe@epamail.epa.gov
Cc: Humphrey.Chip@epamail.epa.gov; 'john.t@windwardenv.com'; Maja Tritt; Gene Revelas; Stefan Wodzicki; Lisa Saban; Thai Do; Jim McKenna; Rick Applegate; Bob Wyatt; Gene Revelas; Laura Kennedy; Mike Johns
Subject: Confirmation of sampling stations during recon trip for R3B fish and invertebrate tissue sampling event
Importance: High

Eric,

Thank you for your notes. Below are our comments on confirmation of sampling station locations. Please note that we are not in a position to discuss any issues related to data quality objectives.

As we discussed on the boat, Maja Tritt and EPA will be in constant contact and will coordinate any adjustments or elimination of locations if the fish or invertebrates are not present at the target locations.

Thank you

Ian

Summary:

The objective was to confirm sampling stations for the Round 3B Fish and Invertebrate Tissue and Collocated Sediment Sampling Event. The research vessel Wolf Eel from Northwest Underwater Construction was used for the reconnaissance trip that took place on August 7, 2007. The participants included the following people:

Integral Consulting: Maja Tritt, Stefan Wodzicki, Ian Stupakoff and Brian Pointer
EPA: Eric Blischke and Joe Goulet
Windward Environmental: Thai Do and John Toll
USFWS: Jeremy Buck
Ridolfi Inc.: Sherrie Duncan and Megan Hilgart
Ellis Ecological Services: Robert Ellis
Smallmouth Bass Association of Portland: Bill Egan (Mr. Egan met with group at boat ramp but did not participate in the recon trip).

LWG presented EPA with the proposed sampling stations from River Mile (RM) 2 to RM 11 as described in the Round 3B FSP. However, EPA also requested that a reconnaissance be made at stations proposed by EPA below RM 2 and above RM 11. The reconnaissance trip included both sides of the river from RM 0.7 to RM 12.2.

Alternate sampling stations were identified for a few sites and are discussed below.

-----Original Message-----

From: Blischke.Eric@epamail.epa.gov [mailto:Blischke.Eric@epamail.epa.gov]
Sent: Wednesday, August 08, 2007 10:59 AM
To: Ian Stupakoff; Goulet.Joe@epamail.epa.gov
Cc: Humphrey.Chip@epamail.epa.gov
Subject: Notes from Fish Recon

Ian and Joe, here are my notes from the recon. Please review to see if they are accurate. I have included some notes on the smallmouth bass sampling effort but recognize that these sampling locations were not fully discussed. As I indicated a number of times on the recon, it will be important to have close communication and coordination in order to adjust or eliminate locations if the fish are not present at the target locations.

CA02W: This location should be targeted for clam sampling - a good beach area was present. EPA only requested one clam, crayfish and sculpin composite along Sauvie Island.

Concur (no changes were made)

Sculpin (SP02W) and crayfish (CR02W) are not needed at this location.

SP01W and CR01W: The presence of rip-rap makes this a promising location for sculpin and crayfish.

Concur that SP02W and CR02W are not ideal habitat and that SP01W and CR01W provide better habitat for both species.

SP01E and CR01E: Elevated levels of DDX, PCB and PAHs were detected in Round 3A sediments just upstream of the Terminal 5 Dock. The target location for Sculpin and Crayfish should be the rip-rap tongue behind the dock area. An alternate crayfish and sculpin location is downstream of the dock at approximately RM 1. Concur that the alternate station and SP01E and CR01E are good habitat for both species:

A clam composite sample should also be included. The target location for the clam sample should be the beach area just upstream of the Terminal 5 Dock.

Concur that the CA01E is good habitat for clams. However, this station falls below RM 2 and will need to have final agreement between EPA and LWG.

SP03E: It was difficult to collect sculpin in this area during Round 1. Start further upstream towards the International Slip and move downstream as necessary. Concur. A new coordinate for that station has been set and fishing will start at target with flexibility of moving downstream. Set lines will be the preferred method of collection. If there is some riprap in the area, backpack electrofishing will also be attempted. Because of past difficulties at this station, Integral will contact EPA the following day after first attempt with a status report.

CA03W: Good beach habitat downstream of Morse Brothers

Concur. No changes made.

CA034W: Target beach area behind and downstream of Kinder Morgan dock.

Concur. New target station location was assigned downstream from dock.

SP04W: Purpose of sample location is to verify phthalate hit in sculpin. Target pilings beneath Linnton Plywood with set lines.

Concur. New target station location was assigned in front of building and set lines will be deployed parallel to pilings.

CA05E: Target beach area in downstream portion of Mar Com initially. If this proves problematic due to presence of pilings and debris, move downstream offshore of international slip. No further downstream than RM 5.

Concur. No changes made.

SP05E: Target piling areas downstream of launchway.

Concur. No changes made.

CA05W: Target small beach areas along downstream portion of Marine Finance.

Concur. New target station location was assigned in front of beach area.

CR05W: Target rip rap downstream of Marine Finance and upstream of Foss docks.
Concur. No changes made.

SP06W and CR06W: Target GASCO/Siltronic property line. Old dock structure and rip-rap at property line.
Concur. No changes made. Fishing will occur downstream of pipeline.

SP07E: Triangle Park - Target is ok.
Concur. No changes made.

SP07W: Discrepancy between ODFW efforts and Round 1 Fish Tissue sampling efforts. ODFW obtained 30 sculpin at RM 7.6. Target nearshore rip-rap between docks. Upstream portion of Willbridge Cove adjacent to McCall as alternate location.
Concur. Alternate target station location was assigned as specified above.

SP08E: Target rip-rap between Fred Devine/M-1 Outfall and Coast Guard facility.
Concur. New target station location was assigned at SE end of dock.

CR08W and SP08W: Target rip-rap downstream of outfall behind Shell dock for sculpin and crayfish.
Concur. No changes made.

SP09W: Target rip-rap between James River and Gunderson docks.
Concur. No changes made.

SP10E: Target point halfway between tall tree cluster and Ashgrove/Goldendale dolphin.
Concur. New target station location was assigned as described above.

SP10W, CR10W and CA10W: Likely a challenging location. Use set lines and traps in among piers for sculpin. Run benthic sledge perpendicular to shore for clams.
Concur. No changes made.

SP11E, CR11E and CA11E: Target area between docks. Get additional information about location of outfall draining Westinghouse to finalize location. Difficult to get a good look at location due to presence of large ships.
Concur. Site is very active with ship movement. Tentative target station location was assigned between Cargill and Glacier docks near dolphin structure. Area is good for sculpin in riprap shoreline near Glacier and pilings for crayfish near Cargill. EPA to check on sediment data to see if station needs to be moved upstream of Cargill.

SP12W, CR12W and CA12W: Target embayment downstream of seawall for sculpin and crayfish. Target beach area behind floating dock for clams.
Concur with clam area being set near sculpin and crayfish with vertical tows away from beach area and parallel to shoreline. New target station location for clams was assigned as described above. Area behind the dock is not accessible by boat and may be too deep to wade.

SP12E, CR12E and CA12E: Target area downstream of floating walkway towards large outfall just upstream of Steel Bridge.
Concur. No changes made.

Smallmouth Bass - RM 10.5 - 12.0. Both sides of river. Target zone between Fremont and Broadway Bridges along east side. Target entire reach on west side.
Concur. New smallmouth bass stations will be assigned as SB11E and SB11W for east and west side of the river respectively.

Smallmouth Bass - RM 4.5 - 5.5 (West side of river): Difficult location during round 1. May need input from Bill Egan or others. Unsure if this was an area targeted by ODFW.

Concur. Because of past difficulties at this station, Integral will contact EPA the following day after first attempt with a status report.

Smallmouth Bass - RM 0.5 - 2.5: The target location is between RM 1 and RM 2.5. Dock structure at Terminal 5 and OSM should be targeted. The Section 10 permit may limit electroshocking upstream of RM 2. In this case, the area offshore of OSM between RM 2 and 2.5 should be targeted.

Concur. New smallmouth bass stations will be assigned as SB02E east side of the river. May be able to collect additional smallmouth bass from west side if unsuccessful on collecting all fish from east side. No problems compositing fish from both sides of the river.

Unsure about statement on boat electrofishing. Request clarification from EPA if angling will be necessary to complement collection of smallmouth bass from RM 1 to RM2 or strictly boat electrofish from RM to RM 2.5 only.

Smallmouth Bass - All other locations: The goal is to target sources with consideration of habitat. Generally, sources targeted with smallmouth bass are larger sources.

No comment.

Close communication will be required to determine level of effort and target zones within a given reach. All fish should be collected and frozen individually. A decision on how to composite will be made following discussions between EPA and LWG.

Concur.

Carp: Three reaches of the river should be targeted: RM 0-4, RM 4-8 and RM 8-12. Three composite samples from each reach should be collected. A good spatial distribution of fish from each reach is desired. Fish should be collected and frozen individually. A decision about how to composite will be made following discussions between EPA and LWG representatives.

Concur. New fishing zones for carp will be assigned to each reach. CP0004 for RM 0-4, CP0408 for RM4-8, and CP0812 for RM 8-12. Collection of carp below RM 2 will follow the same restrictions on boat electrofishing permit as for smallmouth bass.

Ian Stupakoff
Senior Scientist
Integral Consulting Inc.
1205 West Bay Dr.
Olympia, WA 98502
Tel. 360 - 705 - 3534
Fax 360 - 705 - 3669
www.Integral-corp.com

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Appendix A2

EPA. 2007. EPA letter to Lower Willamette Group dated December 3, 2007 (from C. Humphrey and E. Blischke to J. McKenna and R. Wyatt) regarding Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240. Round 3B Field Sampling Plan for Fish and Invertebrate Tissue and Collocated Surface Sediment and Round 2 Quality Assurance Project Plan Addendum 9. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
OREGON OPERATIONS OFFICE
811 S.W. 6th Avenue
Portland, Oregon 97204

December 3, 2007

Mr. Jim McKenna
Port of Portland & Co-Chairman, Lower Willamette Group
121 NW Everett
Portland, Oregon 97209

Mr. Robert Wyatt
Northwest Natural & Co-Chairman, Lower Willamette Group
220 Northwest Second Avenue
Portland, Oregon 97209

Re: Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240. Round 3B Field Sampling Plan for Fish and Invertebrate Tissue and Collocated Surface Sediment and Round 2 Quality Assurance Project Plan Addendum 9

Dear Messrs. Wyatt and McKenna:

EPA provided conditional approval of the Round 3B Field Sampling Plan for Fish and Invertebrate Tissue and Collocated Surface Sediment (Round 3B Fish and Invertebrate Tissue FSP) on August 17, 2007. A final Round 3B Fish and Invertebrate Tissue FSP and associated Quality Assurance Project Plan Addendum 9 (QAPP Addendum 9) were submitted to EPA on October 22, 2007 and October 31, 2007 respectively. These documents address all EPA comments and are hereby approved.

If you have any questions, please contact Chip Humphrey at (503) 326-2678 or Eric Blischke (503) 326-4006. All legal inquiries should be directed to Lori Cora at (206) 553-1115.

Sincerely,

Chip Humphrey
Eric Blischke
Remedial Project Managers

cc: Greg Ulirsch, ATSDR
Rob Neely, NOAA
Ted Buerger, US Fish and Wildlife Service
Preston Sleeper, Department of Interior
Jim Anderson, DEQ
Kurt Burkholder, Oregon DOJ
David Farrer, Oregon Environmental Health Assessment Program
Rick Keppler, Oregon Department of Fish and Wildlife
Michael Karnosh, Confederated Tribes of Grand Ronde
Tom Downey, Confederated Tribes of Siletz
Audie Huber, Confederated Tribes of Umatilla
Brian Cunningham, Confederated Tribes of Warm Springs
Erin Madden, Nez Perce Tribe
Rose Longoria, Confederated Tribes of Yakama Nation

Appendix A3

EPA. 2007. EPA email to Lower Willamette Group dated September 3, 2007 (from B. Shephard to J. McKenna, R. Applegate, and R. Wyatt) regarding Modification to FSP Procedure, Round 3B Biota Sampling, Portland Harbor. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

From: Shephard.Burt@epamail.epa.gov [mailto:Shephard.Burt@epamail.epa.gov]
Sent: Fri 8/31/2007 11:24 AM
To: McKenna, James (Jim); Rick Applegate; Bob Wyatt
Cc: Blischke.Eric@epamail.epa.gov; Humphrey.Chip@epamail.epa.gov
Subject: Fw: Modification to FSP procedure, Round 3B biota sampling, Portland Harbor

Jim, Rick, Bob,

Attached is a confirmation e-mail authorizing a small change to the biota sampling procedures in the Willamette River for the Round 3B biota sampling. The change no longer requires LWG to remove scales from fish that will be the source of fillets for chemical analyses (i.e. there is no longer a requirement to obtain scale off fillets for chemical analysis). Prior discussions with Laura Kennedy of Kennedy Jenks and Dana Davoli of EPA, the field crew and EPA observers of the field collections indicated that all were in agreement with this modification to the FSP.

Please contact me if you have any questions or concerns regarding this change.

Best regards,

Burt Shephard
Risk Evaluation Unit
Office of Environmental Assessment (OEA-095)
U.S. Environmental Protection Agency, Region 10
1200 6th Avenue
Seattle, WA 98101

Telephone: (206) 553-6359

Fax: (206) 553-0119

e-mail: Shephard.Burt@epa.gov

"If your experiment needs statistics to analyze the results, then you ought to have done a better experiment"
- Ernest Rutherford

----- Forwarded by Burt Shephard/R10/USEPA/US on 08/31/2007 11:14 AM

Burt	
Shephard/R10/USE	
PA/US	To
Laura Kennedy	
08/31/2007 09:11	cc
AM	
Eric Blischke/R10/USEPA/US@EPA,	
Chip Humphrey/R10/USEPA/US@EPA,	
Dana Davoli/R10/USEPA/US@EPA,	
Dave Terpening/R10/USEPA/US@EPA	
Subject	

Scale on vs. scale off fish
samples from the Willamette River

Laura,

Dana Davoli in our office has advised me that she does not believe that fish or fish fillets taken from the Willamette River for human health risk assessment purposes need to have their scales removed prior to further processing of the fillets. Both LWG field crews and EPA observers have indicated to me that descaling the fish takes extensive time, and it is a messy process to retain all the scales and place them back with the fish carcass for that part of the whole body analysis.

As descaling has the potential to increase the error of the carcass analytical results, increases field sampling and processing time, and according to our human health risk assessor, is not necessary for human health risk assessment purposes, I've directed the field crew to no longer remove scales from fish samples from which fillets will be taken.

Please contact me if this decision is not in accordance with your understanding of the needs of the human health risk assessment for the Portland Harbor site.

On another subject, Gina Grepo-Grove has been out of the office all week, so I still don't have an answer for you on the need for 300 grams of tissue for analytical purposes.

Best regards,

Burt Shephard
Risk Evaluation Unit
Office of Environmental Assessment (OEA-095)
U.S. Environmental Protection Agency, Region 10
1200 6th Avenue
Seattle, WA 98101

Telephone: (206) 553-6359
Fax: (206) 553-0119

e-mail: Shephard.Burt@epa.gov

"If your experiment needs statistics to analyze the results, then you ought to have done a better experiment"
- Ernest Rutherford

Appendix A4

EPA. 2007. EPA email to Lower Willamette Group dated September 4, 2007 (from B. Shephard to J. McKenna, R. Applegate, and R. Wyatt) regarding Modification to FSP Fish Processing Procedure, Round 3B Biota Sampling, Portland Harbor. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

From: Shephard.Burt@epamail.epa.gov
Sent: Tuesday, September 04, 2007 5:36 PM
To: Jim McKenna; Rick Applegate; Bob Wyatt
Cc: Blischke.Eric@epamail.epa.gov; Humphrey.Chip@epamail.epa.gov; Goulet.Joe@epamail.epa.gov; Gene Revelas; Jessica Pisano; Laura Jones; Laura Kennedy
Subject: Modification to FSP fish processing procedure, Round 3B biota sampling, Portland Harbor

Jim, Rick, Bob,

This e-mail authorizes a modification to the biota processing procedures in the Willamette River for the Round 3B biota sampling. The change authorizes the LWG to process biota samples and fillet fish samples in the clean room of their on-site field laboratory, as opposed to requiring filleting to be performed at an analytical chemistry laboratory. Prior discussions with EPA observers of the fish processing indicated their agreement with this modification to the FSP.

Regarding the FSP requirement to fillet partially thawed fish to minimize tissue and body fluid loss, we are unaware of any reason that the fish would have to be completely frozen before being partially thawed for processing. Dissection of a partially frozen, but not fully frozen fish should also be acceptable. In practice, a workable field procedure is to ice down the fish once initial field measurements and assessments are complete, then transfer fish to onshore freezer units. By the time field crews can retrieve the fish for processing from onshore freezers, the fish should be sufficiently chilled that processing can commence, perhaps with some time to allow the fish to partially thaw. The door of the clean room must remain closed during weighing and processing to ensure positive pressure is maintained in the clean room during sample processing.

It is possible that additional minor modifications to the FSP will be required to successfully implement the sample filleting and processing modification to the FSP. If identified before Thursday, September 6th, they can be discussed and resolved during that day's meeting between EPA and LWG on the biota sampling.

Please contact me if you have any questions or concerns regarding this change.

Best regards,

Burt Shephard
Risk Evaluation Unit
Office of Environmental Assessment (OEA-095)
U.S. Environmental Protection Agency, Region 10

1200 6th Avenue
Seattle, WA 98101

Telephone: (206) 553-6359
Fax: (206) 553-0119

e-mail: Shephard.Burt@epa.gov

"If your experiment needs statistics to analyze the results, then you
ought to have done a better experiment"

- Ernest Rutherford

Appendix A5

LWG. 2007. Lower Willamette Group email dated September 26, 2007 (from J. McKenna to E. Blischke and M. Tritt) regarding Sculpin Sample Mass Requirements. Lower Willamette Group, Portland, OR.

From: McKenna, James (Jim) [Jim.McKenna@portofportland.com]
Sent: Wednesday, September 26, 2007 8:07 AM
To: Blischke.Eric@epamail.epa.gov; Maja Tritt
Cc: Gene Revelas; Ian Stupakoff; johnt@windwardenv.com; jpisano@anchorenv.com; laurakennedy@kennedyjenks.com; ricka@bes.ci.portland.or.us; rjw@nwnatural.com; Stefan Wodzicki; voster@anchorenv.com
Subject: Re: Sculpin Sample Mass Requirements

Eric, thanks for the quick response. The LWG will proceed accordingly. Jim.

-----Original Message-----

From: Blischke.Eric@epamail.epa.gov <Blischke.Eric@epamail.epa.gov>
To: Maja Tritt <mtritt@integral-corp.com>
CC: Gene Revelas <grevelas@integral-corp.com>; Ian Stupakoff <istupakoff@integral-corp.com>; McKenna, James (Jim); John Toll <johnt@windwardenv.com>; Jessica Pisano <jpisano@anchorenv.com>; Laura Kennedy <LauraKennedy@KennedyJenks.com>; Rick Applegate <RickA@bes.ci.portland.or.us>; Bob Wyatt <rjw@nwnatural.com>; Stefan Wodzicki <swodzicki@integral-corp.com>; Valerie Oster <voster@anchorenv.com>
Sent: Tue Sep 25 16:49:18 2007
Subject: RE: Sculpin Sample Mass Requirements

That is correct. We agreed to a target tissue mass of 195 g for sculpin in areas where we want dioxin analysis and 120 g in areas where we do not want dioxin. Right now, there are four sample locations that do not have sufficient sculpin tissue mass:

SP03E
SP05E
SP11E
SP07W

Because of potential dioxin sources (associated with PCBs or PCP) in the vicinity of these target station locations, EPA would like to target 195 g at all four locations. Other locations where EPA would like dioxin analysis include: SP01E, SP06W, SP07E, SP08E, SP08W and SP09W. These six stations are considered complete because the necessary 195 g of tissue mass has been obtained. EPA understands that four outstanding stations are problematic and would like to assess where we are at on Friday once the week's field effort has been completed.

Thanks, Eric

"Maja Tritt"
<mtritt@integral
-corp.com>

To

Eric Blischke/R10/USEPA/US@EPA

09/25/2007 02:56

cc

PM

"Bob Wyatt" <rjw@nwnatural.com>,

"Gene Revelas"

<grevelas@integral-corp.com>,

"Jessica Pisano"

<jpisano@anchorenv.com>, "Jim

McKenna"

<jim.mckenna@portofportland.com>,

"Rick Applegate"
<RickA@bes.ci.portland.or.us>,
"Valerie Oster"
<voster@anchorenv.com>, "John
Toll" <johnt@windwardenv.com>,
"Ian Stupakoff"
<istupakoff@integral-corp.com>,
"Laura Kennedy"
<LauraKennedy@KennedyJenks.com>,
"Stefan Wodzicki"
<swodzicki@integral-corp.com>
Subject
RE: Sculpin Sample Mass
Requirements

Eric,

I understand that EPA today approved the target sample mass for sculpin of 195 g, in conversations with Laura Jones of Integral and with Thai Do of Windward Consulting. Please respond to this message to confirm the approval. We will consider sculpin samples complete when 195 g are collected.

Thank you very much.
Maja

Maja Tritt
Senior Scientist
Integral Consulting Inc.
7900 SE 28th Street, Suite410
Mercer Island, WA 98040
Phone: 206-957-0353
Fax: 206-230-9601

mtritt@integral-corp.com
www.integral-corp.com

This communication is made under the framework of the LWG Participation Agreement and in the parties' common interests in meeting LWG member obligations under the Administrative Order on Consent and in anticipation of litigation concerning liability for the Portland Harbor Superfund site. This communication is intended and believed by the parties to be part of an ongoing and joint effort to develop and maintain a common legal strategy and contains strategies, work product and legal advice within the "common interest" extension of the attorney-client privilege and the work product doctrine. This communication may include attorney-client communications. With respect to communications by private LWG members to public members, those communications are with the expectation that they will be kept confidential by the public entities. The information is intended to be for the use of the individual or entity named above. If you are not the

intended recipient, please be aware that any disclosure, copying, distribution or use of the contents of this information is prohibited. If you have received this electronic transmission in error, please notify us by electronic mail at mttritt@integral-corp.com.

From: Jessica Pisano [<mailto:jpisano@anchorenv.com>]
Sent: Friday, September 21, 2007 10:45 AM
To: Humphrey.Chip@epamail.epa.gov; Blischke.Eric@epamail.epa.gov; Koch.Kristine@epamail.epa.gov
Cc: Lora Boehlke; Bob Wyatt; david.ashton@portofportland.com; wolffg@plu.edu; J Betz; jpisano@anchorenv.com; Jim.McKenna@portofportland.com; Patty Dost (Schwabe); Rick Applegate; Amanda Shellenberger; Andy Davis; Anne Fitzpatrick; barbara smith; Betsy Day; Bill Locke; Brigitte Howe; Carl Stivers; Christine Hawley; Cindy Ryals; Claudia Powers; Cynn timer Henderson; Dave Livesay; Debbie Deetz Silva; Dennis Hanzlick; Dreas Nielsen; Fred Wolf; Garrick Jauregui; Gene Revelas; Gerry Koschal; Heather Brunelle; Helle Andersen; James Peale; Jeff Peterson; Jim Maul; John Gootherts; John Toll; Julie Wilson; Laura Jones; Laura Kennedy; Les Williams; Linda Baker; Lisa Saban; Loren Dunn; Lynne Paretchan; Maja Tritt; Mark L; Mark Lewis ; Merc Coover; Nancy Judd; Nancy Musgrove; Nick Varnum; Ray Walton; Rebecca Desrosiers; Rebekah Brooks; Rick Greiner; Rob Barrick; Rob Pastorok; Robert Truedinger; Sandy Browning; Sean Gormley; Shannon Pierce; Stu Brown; Stuart Dearden; Suzan Campbell; Taku Fuji; Terry Lauck; Tim Browning; Todd Martin; tom pinit; Tom Schadt; Walt Burt; A Gladstone; A Seger; B Ferguson; Bill Joyce; C Reive; D Sanders; D Vallance; Drew Gilpin; F Wolf; Gerald George; J Benedict; J Kincaid; J Snyder; Jessica Pisano; John Ashworth; K Cox; K Koehl; Kim Stafford; M Chandler; M Cramer; M Miller; Mark Schneider; Nanci Klinger; Patty Dost; R Gresh; S David; S Gardner; Soniya Ziegler; T Gold; T McCue; William Earle
Subject: FW: Sculpin Sample Mass Requirements

Hello Chip and Eric,

Please see below and attached.

Regards,
Jessica

Please be advised of Anchor Environmental's new address and update your records accordingly:

Jessica Andersson Pisano
on behalf of Valerie Oster Thompson
Anchor Environmental, L.L.C
6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Phone: 503-670-1108 x19
Fax: 503-670-1128

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From: Gene Revelas [<mailto:grevelas@integral-corp.com>]
Sent: Friday, September 21, 2007 10:29 AM
To: Bob Wyatt; Jessica Pisano; Jim McKenna; Rick Applegate; Valerie

Oster

Cc: Maja Tritt; Ian Stupakoff; Stefan Wodzicki; Laura Jones; Claudia Powers

Subject: FW: Sculpin sample mass requirements

Hi Jessica – please forward this to EPA. Thanks, Gene

Eric and Chip,

I am forwarded this sample target biomass analysis from Maja (she's out today) for discussion on Monday's biota status call. Please forward to Ginna and others on the agency team as needed. If at all possible, we would like to get resolution on this issue on Monday as it may soon become critical to the biota field sampling effort. An updated sample collection status table will be sent out later today. Thanks, Gene

From Maja:

Attached please find a revised sample mass sheet for the sculpin samples that are currently being collected. This sheet provides the maximum sample mass that may be needed. The analysis of dioxins in sculpin is still under discussion, and this analysis accounts for 75 g of tissue mass.

PCB congener levels are expected to be high enough in the sculpin that 10 g of tissue should be sufficient for analysis. A larger sample mass is likely to result in a need for sample dilution. During Round 1, 10 g of sample was used to analyze fish tissue for PCB congeners, and all of the coplanar PCBs were detected in all of the sculpin samples.

In summary, LWG recommends collecting 195 g of sample mass for sculpin if analyses are completed for dioxins, and 120 g if analyses are not completed for dioxins. Additional sample mass would be collected at a single location to allow for preparation of a post-homogenization split and lab QC as shown in the attached table.

We will be available to discuss this issue on Monday during the fishing status telecon.

Maja

Maja Tritt
Senior Scientist
Integral Consulting Inc.
7900 SE 28th Street, Suite 410
Mercer Island, WA 98040
Phone: 206-957-0353
Fax: 206-230-9601

Appendix A6

EPA. 2007. EPA email to Lower Willamette Group dated November 26, 2007 (from E. Blischke to J. Toll) regarding Tissue Mass Requirements for Clam Sampling. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

From: Blischke.Eric@epamail.epa.gov
Sent: Monday, November 26, 2007 5:39 PM
To: John Toll
Cc: Christine Hawley; Gene Revelas; Helle B. Andersen; Jim McKenna; jpisano@anchorenv.com; Lisa Saban; Maja Tritt; ricka@bes.ci.portland.or.us; Bob Wyatt; Valerie Oster
Subject: RE: Tissue Mass Requirements for Clam Sampling

Bottom line for me is if we can be reasonably confident in our tissue mass estimates, EPA is comfortable with moving forward with the tissue samples we have.

Eric

"John Toll"
<johnt@windwardenv.com>
11/26/2007 05:32 PM

To
Eric Blischke/R10/USEPA/US@EPA
cc
<chawley@integral-corp.com>,
<grevelas@integral-corp.com>,
"Helle B. Andersen"
<helleb@windwardenv.com>, "Jim McKenna"
<Jim.McKenna@portofportland.com>,
<jpisano@anchorenv.com>, "Lisa Saban" <lisas@windwardenv.com>,
"Maja Tritt"
<mtritt@integral-corp.com>,
<ricka@bes.ci.portland.or.us>,
"Bob Wyatt" <rjw@nwnatural.com>,
"Valerie Oster"
<voster@anchorenv.com>
Subject
RE: Tissue Mass Requirements for Clam Sampling

Thanks Eric. Sounds like the ball's in our court. John

John Toll, Ph.D.
Partner
Windward Environmental LLC
200 West Mercer Street, Suite 401
Seattle, WA 98119-3958
(206) 812-5433
(206) 913-3292 (cell)
www.windwardenv.com

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-----Original Message-----

From: Blischke.Eric@epamail.epa.gov
[mailto:Blischke.Eric@epamail.epa.gov]
Sent: Monday, November 26, 2007 5:29 PM
To: John Toll
Cc: chawley@integral-corp.com; grevelas@integral-corp.com; Helle B. Andersen; Jim McKenna; jpisano@anchorenv.com; Lisa Saban; Maja Tritt; ricka@bes.ci.portland.or.us; Bob Wyatt; Valerie Oster
Subject: RE: Tissue Mass Requirements for Clam Sampling

John, I have everything I need. Right now, we are comfortable with the tissue mass requirements as specified below:

Chemical Group	Clam Tissue
Dioxin/PCB/Pest +Lipid	10g
PAHs	5g
Hg	2g
SVOCs	5g
Metals and Moisture	3g
TBT	5g
Homogenization loss	5g
Total	35g

Based on a review of the Round 2 benthic tissue sampling, the tissue mass requirements specified above generally resulted in acceptable tissue data. However, during the Round 2 benthic sampling effort, the actual tissue mass as measured in the lab was often significantly less than the tissue mass estimated by shell size. For example, sample BT026 went from 33.69 g (estimated) to 26.77 g (actual). This resulted in the elimination of mercury and TBT analyses from this sample.

I have a call into Maja to discuss further but one question I have is whether the biomass equation has been changed based on the Round 2 experience. Our goal is to avoid the elimination of analytical groups to the extent practicable.

Eric

"John Toll"
<johnt@windwardenv.com>

11/26/2007 10:37
AM

To
Eric Blischke/R10/USEPA/US@EPA
cc
"Maja Tritt"
<mtritt@integral-corp.com>,
"Helle B. Andersen"
<helleb@windwardenv.com>, "Lisa Saban"
<lisas@windwardenv.com>,
<chawley@integral-corp.com>,
<grevelas@integral-corp.com>,
<jpisano@anchorenv.com>, "Valerie Oster"
<voster@anchorenv.com>,
"Bob Wyatt" <rjw@nwnatural.com>,
"Jim McKenna"
<Jim.McKenna@portofportland.com>,
<ricka@bes.ci.portland.or.us>
Subject
RE: Tissue Mass Requirements for
Clam Sampling

Hi Eric. I know you were out of the office last week so I thought I'd check because I haven't seen an e-mail from you confirming completion of the clam sampling. Did you get what you needed to confirm? John

John Toll, Ph.D.
Partner
Windward Environmental LLC
200 West Mercer Street, Suite 401
Seattle, WA 98119-3958
(206) 812-5433
(206) 913-3292 (cell)
www.windwardenv.com

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If you have received this electronic transmission in error, please notify us by electronic mail at johnt@windwardenv.com.

-----Original Message-----

From: Blischke.Eric@epamail.epa.gov
[mailto:Blischke.Eric@epamail.epa.gov]
Sent: Monday, November 19, 2007 3:12 PM
To: mtritt@integral-corp.com
Cc: grevelas@integral-corp.com; Helle B. Andersen; Goulet.Joe@epamail.epa.gov; Humphrey.Chip@epamail.epa.gov
Subject: Tissue Mass Requirements for Clam Sampling

Maja, can you please send a table summarizing the tissue mass requirements for the clam sampling. Once I can confirm the 30 g tissue mass requirement, we can provide confirmation that the clam sampling has been completed. At this time, we just need to be sure that the 36 - 40 g we obtained for 3W, 4W and 5W are sufficient. All other stations should be considered complete - including the station at 12W where 31 g were obtained with significant effort.

Thanks, Eric

Appendix A7

EPA. 2007. EPA email to Lower Willamette Group dated September 27, 2007 (from E. Blischke to J. McKenna, R. Wyatt, and R. Applegate) regarding the Biota Tissue Sampling. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

From: Blischke.Eric@epamail.epa.gov
Sent: Thursday, September 27, 2007 4:57 PM
To: Jim.McKenna@portofportland.com; rjw@nwnatural.com; ricka@bes.ci.portland.or.us
Cc: Maja Tritt; Gene Revelas
Subject: Biota Tissue Sampling

All,

EPA has concluded that the current phase of the LWG Round 3B biota sampling effort is complete. EPA understands that the LWG field crew met the tissue mass requirements for smallmouth bass, carp and crayfish at all sampling locations. Regarding sculpin, EPA understands that the LWG field crew was able to meet the modified tissue mass requirements at all locations except for SP11E. Approximately 58 g of tissue mass was obtained at this location.

EPA understands that the clam sampling is scheduled to begin in November. Further discussion is still required regarding EPA's analysis of VOCs in fish tissue.

Finally, EPA would like to commend the field crew and members of the Bass and Panfishers club for their efforts.

If you have any questions, please let me know.

Thanks, Eric

Appendix A8

EPA. 2007. EPA email to Lower Willamette Group dated November 27, 2007 (from E. Blischke to R. Applegate, J. McKenna, and R. Wyatt) regarding the Round 3B Clam Sampling. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

From: Blischke.Eric@epamail.epa.gov
Sent: Tuesday, November 27, 2007 10:04 AM
To: ricka@bes.ci.portland.or.us; Jim.McKenna@portofportland.com; rjw@nwnatural.com
Cc: Maja Tritt; Helle B. Andersen; johnt@windwardenv.com; Gene Revelas; Davoli.Dana@epamail.epa.gov; Goulet.Joe@epamail.epa.gov; Shephard.Burt@epamail.epa.gov; Humphrey.Chip@epamail.epa.gov; laurakennedy@kennedyJenks.com
Subject: Round 3B Clam Sampling

Based on an email from Helle Anderson dated November 19, 2007, EPA understands that the table presented below represents the estimated clam biomass obtained during the clam sampling effort that took place during the week of November 12, 2007.

-----+-----+-----+-----+-----+-----+-----						
-----+-----+-----+-----+-----+-----+-----						
-----+-----+-----+-----+-----+-----+-----						
Station	Number	Estimated	Non-Depurated			Depurated Sample
	of Tows	Biomass	Sample			
		(g)				
-----+-----+-----+-----+-----+-----+-----						
			LWG	EPA	Replicate	
-----+-----+-----+-----+-----+-----+-----						
01E	15	181	X	X	X	X
-----+-----+-----+-----+-----+-----+-----						
02W	16	92	X	X		X (17 g)
-----+-----+-----+-----+-----+-----+-----						
03W	18	40	X			
-----+-----+-----+-----+-----+-----+-----						
04W	16	36	X			
-----+-----+-----+-----+-----+-----+-----						
05E	15	73	X	X		
-----+-----+-----+-----+-----+-----+-----						
05W	24	39	X			
-----+-----+-----+-----+-----+-----+-----						
10W	16	88	X	X		X (13 g)
-----+-----+-----+-----+-----+-----+-----						
11E	11	150	X	X		X
-----+-----+-----+-----+-----+-----+-----						
12W	27*	31	X			
-----+-----+-----+-----+-----+-----+-----						
12E	19	111	X	X		X (36 g)

* Total number of tows including 7 or 8 done on the inside of the dock - the clams were found on the outside of the dock

EPA acknowledges that even though the target tissue mass of 140 g was not met at all stations, the minimum amount of clam tissue (35 g) necessary for chemical analysis was obtained at all but one station. In addition, EPA acknowledges that at many of the station locations more than FSP specified maximum of 15 tows were performed including station 12W where 27 tows resulted in an estimated biomass of 31g. As a result, EPA has determined that the clam sampling effort is complete. However, EPA recognizes that the amount of biomass presented in the above table is an estimate based on shell size and that at station 12W and perhaps other stations (e.g., 4W), elimination of low priority of chemical analyses and/or elevated detection limits may be required. Please provide actual sample mass from the analytical laboratory as soon as is practicable so that we may begin the discussion of chemical analysis.

If you have any questions, please contact me.

Thanks, Eric

Appendix A9

EPA. 2007. EPA email and attachment to Lower Willamette Group dated October 16, 2007 (from E. Blischke to J. Pisano) regarding EPA Notification: Table of R3B Crayfish Composites/Requested comments by Friday 10/12/2007. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

From: Blischke.Eric@epamail.epa.gov
Sent: Tuesday, October 16, 2007 4:26 PM
To: Jessica Pisano
Cc: Anne Fitzpatrick; A Gladstone; A Seger; Andy Davis; Amanda Shellenberger; barbara smith; Betsy Day; B Ferguson; Brigitte ; Christine Hawley; Cynn timer Henderson; Humphrey.Chip@epamail.epa.gov; C Reive; Cindy Ryals; Claudia Powers; Carl Stivers; david.ashton@portofportland.com; D Sanders; D Deetz Silva; D Vallance; Dennis Hanzlick; D Livesay; Dreas Nielsen; F Wolf; Fred Wolf; Garrick Jauregui; Gerald George; Drew Gilpin; G Koschal; Gene Revelas; Heather Brunelle; Helle Andersen; J Benedict; J Betz; John Gootherts; Jim.McKenna@portofportland.com; J Kincaid; Jim Maul; John Toll; John Ashworth; Rick Greiner; James Peale; Jeff Peterson; jpisano@anchorenv.com; J Snyder; Julie Wilson; K Cox; Kim Stafford; Kelley Martin; K Koehl; Koch.Kristine@epamail.epa.gov; Laura Kennedy; Linda Baker; Loren Dunn; Lisa Saban; Laura Jones; L Paretchan; Les Williams; Mark Leece; M Cramer; M Miller; M Chandler; Merc Coover; Mark Lewis; Maja Tritt; Mark Schneider; Nancy Musgrove; Nancy Judd; Nanci Klinger; Nick Varnum; Patty Dost (Schwabe); Rob Barrick; Rebekah Brooks; Rebecca Desrosiers; Rick Applegate; Bob Wyatt; Robert Truedinger; R Gresh; Rob Pastorok; Ray Walton; S Gardner; S Brown; Sandy Browning; Suzan Campbell; Sean Gormley; Shannon Pierce; S David; Stuart Dearden; Soniya Ziegler; Taku Fuji; Tim Browning; Terry Lauck; T Gold; Todd Martin; tom pinit; T McCue; Tom Schadt; Valerie Oster; Walt Burt; William Earle; Bill Joyce; Bill Locke; wolffg@plu.edu
Subject: Re: FW: EPA Notification: Table of R3B Crayfish Composites/Requested comments by Friday 10/12/2007

Attachments: Crayfish composites.xls



Crayfish
composites.xls

The proposed compositing approach for crayfish is meets the requirements of the FSP and is acceptable to EPA.

Thanks, Eric

"Jessica Pisano"
<jpisano@anchorenv.com>

10/11/2007 09:25
AM

To
Eric Blischke/R10/USEPA/US@EPA,
Chip Humphrey/R10/USEPA/US@EPA,
Kristine Koch/R10/USEPA/US@EPA
cc

"Maja Tritt"
<mtritt@integral-corp.com>, "Gene Revelas"
<grevelas@integral-corp.com>,
"Valerie Oster"
<voster@anchorenv.com>,
"Christine Hawley"
<chawley@integral-corp.com>,
"Claudia Powers"
<Ckp@aterwynne.com>, "Sandy Browning"
<sbrowning@integral-corp.com>,
<kmartin@integral-corp.com>, "Bob Wyatt" <rjw@nwnatural.com>,
<david.ashton@portofportland.com>,
<wolffg@plu.edu>, "J Betz"

<jbetz@ci.portland.or.us>,
 <jpisano@anchorenv.com>,
 <Jim.McKenna@portofportland.com>,
 "Patty Dost \"(Schwabe)\""
 <Pdost@Schwabe.com>, "Rick
 Applegate"
 <RICKA@BES.CI.PORTLAND.OR.US>, "A
 Gladstone"
 <agladstone@davisrothwell.com>,
 "A Seger"
 <andrea.seger@portofportland.com>
 , "Andy Davis"
 <andy@geomega.com>, "B Ferguson"
 <bob.ferguson@slli.net>, "Bill
 Joyce" <wjjoyce@sjzlaw.com>,
 "Brigitte "
 <brigitte@geomega.com>, "C Reive"
 <chris.reive@jordanschrader.com>,
 "D Deetz Silva" <DeetzD@osm.com>,
 "D Livesay"
 <dlivesay@groundwatersolutions.co
 m>, "D Sanders"
 <dawns@bes.ci.portland.or.us>, "D
 Vallance"
 <derrick.d.vallance@conocophillip
 s.com>, "Drew Gilpin"
 <gilpinA@osm.com>, "F Wolf"
 <frederick.wolf@total.com>, "G
 Koschal"
 <gkoschal@redhillssenv.com>,
 "Garrrick Jauregui"
 <garrick@chevron.com>, "Gerald
 George"
 <gerald.george@pillsburylaw.com>,
 "J Benedict" <jbenedic@chbh.com>,
 "J Kincaid" <jkincaid@chbh.com>,
 "J Snyder" <jpsnyder@stoel.com>,
 "James Peale"
 <jpeale@mfainc.org>, "Jessica
 Pisano" <jpisano@anchorenv.com>,
 "John Ashworth"
 <john.ashworth@bullivant.com>,
 "John Gootherts"
 <jGootherts@schwabe.com>, "Julie
 Wilson"
 <jwilson@enviroissues.com>, "K
 Cox"
 <kimc@bes.ci.portland.or.us>, "K
 Koehl"
 <krista.koehl@portofportland.com>
 , "Kim Stafford"
 <kims@tonkon.com>, "L Paretchan"
 <Lparetchan@perkinscoie.com>,
 "Loren Dunn"
 <ldunn@riddellwilliams.com>, "M
 Chandler"
 <mchandler@timeoil.com>, "M
 Cramer"
 <Martin.A.Cramer@conocophillips.c
 om>, "M Miller" <Max@tonkon.com>,
 "Mark Leece"
 <mark.leece@ch2m.com>, "Mark
 Lewis" <mlewis@newfields.com>,
 "Mark Schneider"
 <mwschneider@perkinscoie.com>,
 "Nanci Klinger"

<nklinger@ci.portland.or.us>,
 "Patty Dost" <pdost@schwabe.com>,
 "R Gresh" <roger.gresh@amec.com>,
 "Robert Truedinger"
 (b) (6), "S
 Brown" <sbrown@bridgeh2o.com>, "S
 David"
 <sheila.david@portofportland.com>
 , "S Gardner"
 <sarag@bes.ci.portland.or.us>,
 "Sean Gormley"
 <sean.gormley@amec.com>, "Soniya
 Ziegler" <sziegler@chevron.com>,
 "Stuart Dearden"
 <stuart.dearden@sanofi-aventis.co
 m>, "T Gold" <tgold@sjzlaw.com>,
 "T McCue"
 <tom.mccue@siltronic.com>, "Terry
 Lauck"
 <terry.s.lauck@conocophillips.com
 >, "William Earle"
 <WEARLE@davisrothwell.com>,
 "Amanda Shellenberger"
 <ashellenberger@anchorenv.com>,
 "Anne Fitzpatrick"
 <afitzpatrick@retec.com>,
 "barbara smith"
 <barbara@harrisandsmith.com>,
 "Betsy Day"
 <bday@integral-corp.com>, "Bill
 Locke"
 <wlocke@integral-corp.com>, "Carl
 Stivers"
 <cstivers@anchorenv.com>, "Cindy
 Ryals"
 <Cindyryals@kennedyjenks.com>,
 "Cynnie Henderson"
 <chenderson@integral-corp.com>,
 "Dennis Hanzlick"
 <dhanzlick@anchorenv.com>, "Dreas
 Nielsen"
 <dnielsen@integral-corp.com>,
 "Fred Wolf"
 <fred.wolf@total.com>, "Heather
 Brunelle"
 <heatherbrunelle@kennedyjenks.com
 >, "Helle Andersen"
 <helleb@windwardenv.com>, "Jeff
 Peterson" <jpeterson@mfainc.org>,
 "Jim Maul" <jmaul@mfainc.org>,
 "John Toll"
 <johnt@windwardenv.com>, "Laura
 Jones"
 <ljones@integral-corp.com>,
 "Laura Kennedy"
 <laurakennedy@kennedyjenks.com>,
 "Les Williams"
 <Lwilliams@integral-corp.com>,
 "Linda Baker" <lbaker@retec.com>,
 "Lisa Saban"
 <lisas@windwardenv.com>, "Merc
 Coover" <mcoover@retec.com>,
 "Nancy Judd"
 <nancyj@windwardenv.com>, "Nancy
 Musgrove" <m.e.r@attglobal.net>,
 "Nick Varnum"

<nvarnum@integral-corp.com>, "Ray
Walton"
<rwalton@westconsultants.com>,
"Rebecca Desrosiers"
<rdesrosiers@anchorenv.com>,
"Rebekah Brooks"
<rbrooks@landauinc.com>, "Rick
Greiner"
<john.f.greiner@conocophillips.co
m>, "Rob Barrick"
<rbarrick@entrix.com>, "Rob
Pastorok"
<rpastorok@integral-corp.com>,
"Shannon Pierce"
<shannonp@windwardenv.com>,
"Suzan Campbell"
<scampbell@integral-corp.com>,
"Taku Fuji"
<takufuji@kennedyjenks.com>, "Tim
Browning"
<tbrowning@deltaenv.com>, "Todd
Martin"
<tmartin@integral-corp.com>, "tom
pinit"
<tompinit@kennedyjenks.com>, "Tom
Schadt" <tschadt@anchorenv.com>,
"Walt Burt"
<wburt@groundwatersolutions.com>
Subject
FW: EPA Notification: Table of
R3B Crayfish Composites/Requested
comments by Friday 10/12/2007

Eric and Chip,

Please see attached and below.

Regards,
Jessica

Jessica Andersson Pisano
on behalf of Valerie Oster Thompson
Anchor Environmental, L.L.C
6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Phone: 503-670-1108 x19
Fax: 503-670-1128
From: Maja Tritt [mailto:mtritt@integral-corp.com]
Sent: Thursday, October 11, 2007 8:02 AM
To: Jessica Pisano
Cc: Bob Wyatt; Gene Revelas; Jessica Pisano; Jim McKenna; Rick Applegate; Valerie Oster;
Christine Hawley; ckp@aterwynne.com
Subject: Table of R3B crayfish composites for EPA

Jessica,

Please forward the attached and following to EPA. Thanks.

Eric and Chip,

Attached please find an Excel table of crayfish to be included in the composite sample for each Round 3B sampling location. Individuals will be included in the composite for their sampling location if they meet the length criterion in the draft FSP, a minimum of 100 mm for crayfish.

Individuals that do not meet the length criterion will be excluded.

Crayfish were difficult to collect at location CR01E, but the alternate location was sampled successfully. The crayfish from the alternate location will be composited and analyzed. The individuals from the original location will be excluded.

In order to expedite homogenization and analysis of these samples, please reply by COB on Friday, October 12, stating whether you agree with this approach.

Thank you very much.

Maja Tritt

Maja Tritt
Senior Scientist
Integral Consulting Inc.
7900 SE 28th Street, Suite410
Mercer Island, WA 98040
Phone: 206-957-0353
Fax: 206-230-9601

mtritt@integral-corp.com
www.integral-corp.com

This communication is made under the framework of the LWG Participation Agreement and in the parties' common interests in meeting LWG member obligations under the Administrative Order on Consent and in anticipation of litigation concerning liability for the Portland Harbor Superfund site. This communication is intended and believed by the parties to be part of an ongoing and joint effort to develop and maintain a common legal strategy and contains strategies, work product and legal advice within the "common interest" extension of the attorney-client privilege and the work product doctrine. This communication may include attorney-client communications. With respect to communications by private LWG members to public members, those communications are with the expectation that they will be kept confidential by the public entities. The information is intended to be for the use of the individual or entity named above. If you are not the intended recipient, please be aware that any disclosure, copying, distribution or use of the contents of this information is prohibited.

If you have received this electronic transmission in error, please notify us by electronic mail at mtritt@integral-corp.com.

(See attached file: Crayfish composites.xls)

Summary of Crayfish Lengths and Weights

Station ID	Fish Number	Fish ID	Date of Collection	Length (mm)	Weight, Whole Fish (g)	Length ≥ 100 mm?	Include in composite?	Composite Weight (g)
CR01E ¹	01	LW3-CR01E-01	9/5/2007	124	60.6	Y	NA	242.8
	02	LW3-CR01E-02	9/11/2007	112	31.2	Y	NA	
	03	LW3-CR01E-03	9/11/2007	105	25.8	Y	NA	
	Dock6-06	LW3-CR01E-06	9/11/2007	128	51.1	Y	NA	
	Dock6-07	LW3-CR01E-07	9/11/2007	139	74.1	Y	NA	
CR01E - Alt	Dock1-04	LW3-CR01E-Alt-04	9/11/2007	144	54.6	Y	X	331.1
	Dock1-05	LW3-CR01E-Alt-05	9/11/2007	134	46.7	Y	X	
	Dock1-08	LW3-CR01E-Alt-08	9/11/2007	114	40.2	Y	X	
	Dock1-09	LW3-CR01E-Alt-09	9/11/2007	109	41.1	Y	X	
	Dock1-10	LW3-CR01E-Alt-10	9/11/2007	124	43.7	Y	X	
	Dock1-11	LW3-CR01E-Alt-11	9/11/2007	139	55.5	Y	X	
	Dock1-12	LW3-CR01E-Alt-12	9/11/2007	121	49.3	Y	X	
CR01W	01	LW3-CR01W-01	8/30/2007	114	46.0	Y	X	413.5
	02	LW3-CR01W-02	8/30/2007	120	52.5	Y	X	
	03	LW3-CR01W-03	8/30/2007	106	36.2	Y	X	
	04	LW3-CR01W-04	8/30/2007	102	28.3	Y	X	
	05	LW3-CR01W-05	8/30/2007	115	59.0	Y	X	
	06	LW3-CR01W-06	8/31/2007	137	103.9	Y	X	
	07	LW3-CR01W-07	8/31/2007	113	47.0	Y	X	
	08	LW3-CR01W-08	8/31/2007	107	40.6	Y	X	
CR05W	01	LW3-CR05W-01	8/28/2007	123	68.9	Y	X	341.5
	02	LW3-CR05W-02	8/28/2007	119	63.1	Y	X	
	03	LW3-CR05W-03	8/28/2007	112	47.0	Y	X	
	04	LW3-CR05W-04	8/28/2007	111	35.8	Y	X	
	05	LW3-CR05W-05	8/28/2007	113	57.1	Y	X	
	06	LW3-CR05W-06	8/29/2007	123	69.6	Y	X	
CR06W	01	LW3-CR06W-01	8/28/2007	123	70.8	Y	X	384.9
	02	LW3-CR06W-02	8/29/2007	108	40.2	Y	X	
	03	LW3-CR06W-03	8/30/2007	101	31.7	Y	X	
	04	LW3-CR06W-04	8/30/2007	96	31.0	N		
	05	LW3-CR06W-05	8/31/2007	99	44.5	N		
	06	LW3-CR06W-06	9/5/2007	119	53.9	Y	X	
	07	LW3-CR06W-07	9/5/2007	123	62.7	Y	X	
	08	LW3-CR06W-08	9/6/2007	112	43.1	Y	X	
CR08W	09	LW3-CR06W-09	9/6/2007	131	82.5	Y	X	394
	01	LW3-CR08W-01	8/28/2007	108	36.9	Y	X	
	02	LW3-CR08W-02	9/5/2007	104	30.6	Y	X	
	03	LW3-CR08W-03	9/5/2007	108	40.6	Y	X	
	04	LW3-CR08W-04	9/7/2007	102	30.7	Y	X	
	05	LW3-CR08W-05	9/14/2007	109	28.3	Y	X	
	06	LW3-CR08W-06	9/14/2007	120	31	Y	X	
	07	LW3-CR08W-07	9/14/2007	116	35.6	Y	X	
	08	LW3-CR08W-08	9/18/2007	112	55.2	Y	X	
	09	LW3-CR08W-09	9/25/2007	121	74.4	Y	X	
CR10W	10	LW3-CR08W-10	9/25/2007	107	30.7	Y	X	425.2
	01	LW3-CR10W-01	8/28/2007	115	54.2	Y	X	
	02	LW3-CR10W-02	8/28/2007	115	67.9	Y	X	
	03	LW3-CR10W-03	8/28/2007	107	37.2	Y	X	
	04	LW3-CR10W-04	8/29/2007	111	36.1	Y	X	
	05	LW3-CR10W-05	8/29/2007	107	50.2	Y	X	

Station ID	Fish Number	Fish ID	Date of Collection	Length (mm)	Weight, Whole Fish (g)	Length ≥ 100 mm?	Include in composite?	Composite Weight (g)
CR11E	06	LW3-CR10W-06	8/30/2007	102	29.9	Y	X	435.7
	07	LW3-CR10W-07	8/30/2007	111	47.4	Y	X	
	08	LW3-CR10W-08	8/30/2007	112	58.9	Y	X	
	09	LW3-CR10W-09	8/30/2007	103	43.4	Y	X	
	01	LW3-CR11E-01	8/31/2007	106	38.1	Y	X	
	02	LW3-CR11E-02	9/5/2007	111	45.8	Y	X	
	03	LW3-CR11E-03	9/5/2007	112	65.2	Y	X	
	04	LW3-CR11E-04	9/5/2007	107	55.0	Y	X	
CR12E	05	LW3-CR11E-05	9/5/2007	114	51.8	Y	X	327.5
	06	LW3-CR11E-06	9/5/2007	109	48.8	Y	X	
	07	LW3-CR11E-07	9/6/2007	129	83	Y	X	
	08	LW3-CR11E-08	9/6/2007	107	48	Y	X	
	01	LW3-CR12E-01	8/31/2007	102	46.6	Y	X	
	02	LW3-CR12E-02	8/31/2007	108	33.9	Y	X	
	03	LW3-CR12E-03	9/5/2007	103	32.3	Y	X	
	04	LW3-CR12E-04	9/5/2007	102	28.0	Y	X	
CR12W	05	LW3-CR12E-05	9/5/2007	111	35.4	Y	X	388.4
	06	LW3-CR12E-06	9/5/2007	113	51.1	Y	X	
	07	LW3-CR12E-07	9/5/2007	123	65.0	Y	X	
	08	LW3-CR12E-08	9/5/2007	107	35.2	Y	X	
	01	LW3-CR12W-01	8/31/2007	106	38.1	Y	X	
	02	LW3-CR12W-02	8/31/2007	105	34.9	Y	X	
	03	LW3-CR12W-03	8/31/2007	112	60.3	Y	X	
	04	LW3-CR12W-04	8/31/2007	105	34.3	Y	X	
	05	LW3-CR12W-05	8/31/2007	106	46.1	Y	X	
	06	LW3-CR12W-06	8/31/2007	111	39.2	Y	X	
	07	LW3-CR12W-07	9/5/2007	97	27.4	N		
	08	LW3-CR12W-08	9/5/2007	108	51.5	Y	X	
	09	LW3-CR12W-09	9/5/2007	104	43.1	Y	X	
	10	LW3-CR12W-10	9/5/2007	101	40.9	Y	X	

¹ Location CR01E was abandoned in preference to location CR01E-Alt. Fishing success was greater at the alternate location. Crayfish from the abandoned location will not be included in the composites.

Appendix A10

LWG. 2007. Lower Willamette Group email and attachment to EPA dated October 11, 2007 (from J. Pisano to E. Blischke, C. Humphrey, and K. Koch) regarding EPA Notification: Table of R3B Crayfish Composites/Requested comments by Friday 10/12/2007. Lower Willamette Group, Portland, OR.

From: Jessica Pisano [jpisano@anchorenv.com]
Sent: Tuesday, October 16, 2007 5:45 PM
To: Blischke.Eric@epamail.epa.gov; Humphrey.Chip@epamail.epa.gov; Koch.Kristine@epamail.epa.gov
Cc: Maja Tritt; Gene Revelas; McKenna, James (Jim); Rick Applegate; Christine Hawley; Claudia Powers; Laura Kennedy; John Toll; Bob Wyatt; david.ashton@portofportland.com; wolffg@plu.edu; J Betz; jpisano@anchorenv.com; Patty Dost (Schwabe); Rick Applegate; voster@anchorenv.com; A Gladstone; A Seger; Andy Davis; B Ferguson; Bill Joyce; Brigitte ; C Reive; D Deetz Silva; D Livesay; D Sanders; D Vallance; Drew Gilpin; F Wolf; G Koschal; Garrick Jauregui; Gerald George; J Benedict; J Kincaid; J Snyder; James Peale; John Ashworth; John Gootherts; Julie Wilson; K Cox; K Koehl; Kim Stafford; L Parechan; Loren Dunn; M Chandler; M Cramer; M Miller; Mark Leece; Mark Lewis; Mark Schneider; Nanci Klinger; R Gresh; Robert Truedinger; S Brown; S David; S Gardner; Sean Gormley; Soniya Ziegler; Stuart Dearden; T Gold; T McCue; Terry Lauck; voster@anchorenv.com; William Earle; Amanda Shellenberger; Anne Fitzpatrick; barbara smith; Betsy Day; Bill Locke; Carl Stivers; Cindy Ryals; Cynnie Henderson; Dennis Hanzlick; Dreas Nielsen; Fred Wolf; Heather Brunelle; Helle Andersen; Jeff Peterson; Jessica Pisano; Jim Maul; Laura Jones; Les Williams; Linda Baker; Lisa Saban; Merc Coover; Nancy Judd; Nancy Musgrove; Nick Varnum; Ray Walton; Rebecca Desrosiers; Rebekah Brooks; Rick Greiner; Rob Barrick; Rob Pastorok; Sandy Browning; Shannon Pierce; Suzan Campbell; Taku Fuji; Tim Browning; Todd Martin; tom pinit; Tom Schadt; Walt Burt
Subject: FW: EPA Notification: Table of Round 3B Sculpin Composites
Attachments: Sculpin composites 20071011.xls

Eric and Chip-

Please see attached and below.

Regards, Jessica

Jessica Andersson Pisano
on behalf of Valerie Oster
Anchor Environmental, L.L.C
6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Phone: 503-670-1108 x19
Fax: 503-670-1128

From: Maja Tritt [mailto:mtritt@integral-corp.com]
Sent: Tuesday, October 16, 2007 5:21 PM
To: Jessica Pisano
Cc: Bob Wyatt; Gene Revelas; Jessica Pisano; Jim McKenna; Rick Applegate; Valerie Oster; Christine Hawley; Claudia Powers; Laura Kennedy; John Toll
Subject: Table of Round 3B sculpin composites for EPA

Jessica,

Please provide the attached table and following message to EPA. Thanks.

Eric and Chip,

Attached please find an Excel table of sculpin to be included in the composite sample for each Round 3B sampling location. For the most part, individuals from each location will be included in the composite if they meet the length criterion in the draft FSP, a minimum of 90 mm.

At location SP11E, insufficient material was collected to meet the target mass of 195g. One sculpin, number LW3-SP11E-12, was 89 mm long, just below the target length. This sculpin will be included in the composite to increase the total mass of tissue available for analysis, as recommended by EPA (Eric Blischke, Joe Goulet, and Burt Shephard) during the biota sampling status call on October 1, 2007. For all other locations, the fish included in the composite meet or exceed the minimum size target provided in the FSP.

At each of three locations (i.e., SP10E, SP10W, and SP12E), an unusually large sculpin was collected that weighed well over 100 g. These individuals are highlighted in yellow on the attached spreadsheet. The range of sculpin weights was otherwise 6.6 to 76.6 g for sculpin that meet the length criterion. For Round 1, individual weights ranged from 10 to 60 g. The three large sculpin are excluded from the composites to maintain comparability with sculpin weights used in Round 1. In addition, sculpin become more piscivorous as they get older, and these large sculpin are therefore less representative of the non-piscivorous carnivorous fish that are the intended target of this study.

In order to expedite homogenization and analysis of these samples, please reply by COB on Friday, October 19, stating whether you agree with this approach.

Thank you very much.

Maja Tritt

Maja Tritt
Senior Scientist
Integral Consulting Inc.
7900 SE 28th Street, Suite 410
Mercer Island, WA 98040
Phone: 206-957-0353
Fax: 206-230-9601

mttritt@integral-corp.com
www.integral-corp.com

Summary of Sculpin Lengths and Weights

Station ID	Fish Number	Fish ID	Date of Collection	Length (mm)	Weight, Whole Fish (g)	Length ≥ 90 mm?	Include in composite?	Composite Weight (g)
SP01E ¹	Dock6-01	LW3-SP01E-01	9/11/2007	151	48.1	Y	NA	48.1
SP01E - Alt	01	LW3-SP01E-Alt-01	8/31/2007	143	36.6	Y	X	243.7
	02	LW3-SP01E-Alt-02	9/5/2007	147	41.4	Y	X	
	03	LW3-SP01E-Alt-03	9/12/2007	140	28	Y	X	
	04	LW3-SP01E-Alt-04	9/12/2007	88	5.5	N		
	05	LW3-SP01E-Alt-05	9/12/2007	116	14	Y	X	
	06	LW3-SP01E-Alt-06	9/12/2007	111	16.3	Y	X	
	07	LW3-SP01E-Alt-07	9/12/2007	135	24.8	Y	X	
	08	LW3-SP01E-Alt-08	9/13/2007	154	36.4	Y	X	
	09	LW3-SP01E-Alt-09	9/13/2007	157	46.2	Y	X	
SP01W	01	LW3-SP01W-01	8/31/2007	133	28.5	Y	X	199.7
	02	LW3-SP01W-02	9/11/2007	110	18	Y	X	
	03	LW3-SP01W-03	9/11/2007	104	11.5	Y	X	
	04	LW3-SP01W-04	9/11/2007	111	19.5	Y	X	
	05	LW3-SP01W-05	9/11/2007	115	20.7	Y	X	
	06	LW3-SP01W-06	9/11/2007	109	17.4	Y	X	
	07	LW3-SP01W-07	9/11/2007	104	12.9	Y	X	
	08	LW3-SP01W-08	9/11/2007	120	23.2	Y	X	
	09	LW3-SP01W-09	9/11/2007	90	9.5	Y	X	
	10	LW3-SP01W-10	9/19/2007	94	9.2	Y	X	
	11	LW3-SP01W-11	9/19/2007	88	8.3	N		
	12	LW3-SP01W-12	9/19/2007	116	17.3	Y	X	
SP03E	01	LW3-SP03E-01	8/31/2007	159	42.4	Y	X	197.3
	02	LW3-SP03E-02	9/7/2007	88	25	N		
	03	LW3-SP03E-03	9/7/2007	139	32.3	Y	X	
	04	LW3-SP03E-04	9/21/2007	121	23.4	Y	X	
	05	LW3-SP03E-05	9/26/2007	139	36.3	Y	X	
	06	LW3-SP03E-06	9/27/2007	109	14.8	Y	X	
	07	LW3-SP03E-07	9/27/2007	130	22.1	Y	X	
SP04W	08	LW3-SP03E-08	9/27/2007	131	26.0	Y	X	
	01	LW3-SP04W-01	9/5/2007	118	23.9	Y	X	330.6
	02	LW3-SP04W-02	9/5/2007	122	27.1	Y	X	
	03	LW3-SP04W-03	9/6/2007	104	15.3	Y	X	
	04	LW3-SP04W-04	9/7/2007	122	22.6	Y	X	
	05	LW3-SP04W-05	9/7/2007	140	29	Y	X	
	06	LW3-SP04W-06	9/7/2007	151	46.6	Y	X	
	07	LW3-SP04W-07	9/11/2007	142	39.3	Y	X	
	08	LW3-SP04W-08	9/12/2007	175	73.5	Y	X	
	09	LW3-SP04W-09	9/12/2007	160	53.3	Y	X	
SP05E	01	LW3-SP05E-01	9/10/2007	109	19.1	Y	X	208.5
	02	LW3-SP05E-02	9/10/2007	89	11	N		
	03	LW3-SP05E-03	9/10/2007	98	13	Y	X	
	04	LW3-SP05E-04	9/10/2007	97	12.9	Y	X	
	05	LW3-SP05E-05	9/12/2007	121	24.2	Y	X	
	06	LW3-SP05E-06	9/12/2007	124	19.2	Y	X	
	07	LW3-SP05E-07	9/13/2007	129	26.7	Y	X	
	08	LW3-SP05E-08	9/14/2007	127	20	Y	X	
	09	LW3-SP05E-09	9/24/2007	111	15.5	Y	X	
	10	LW3-SP05E-10	9/27/2007	110	17.8	Y	X	
	11	LW3-SP05E-11	9/27/2007	149	40.1	Y	X	
SP06W	E01	LW3-SP06W-01	8/29/2007	100	11.5	Y	X	233.4
	E02	LW3-SP06W-02	8/29/2007	119	18.7	Y	X	
	E03	LW3-SP06W-03	8/29/2007	88	8.8	N		
	E04	LW3-SP06W-04	8/29/2007	97	12.9	Y	X	
	E05	LW3-SP06W-05	8/29/2007	123	25.3	Y	X	
	E06	LW3-SP06W-06	8/29/2007	91	9.7	Y	X	
	E07	LW3-SP06W-07	8/29/2007	86	8.0	N		
	E08	LW3-SP06W-08	8/29/2007	89	8.7	N		
	E09	LW3-SP06W-09	8/29/2007	109	16.3	Y	X	
	E10	LW3-SP06W-10	8/29/2007	90	8.5	Y	X	
	E11	LW3-SP06W-11	8/29/2007	92	7.4	Y	X	
	E12	LW3-SP06W-12	8/29/2007	88	8.2	N		
	E13	LW3-SP06W-13	8/29/2007	87	7.5	N		
	14	LW3-SP06W-14	8/29/2007	86	6.3	N		
	15	LW3-SP06W-15	8/29/2007	85	6.9	N		

Station ID	Fish Number	Fish ID	Date of Collection	Length (mm)	Weight, Whole Fish (g)	Length ≥ 90 mm?	Include in composite?	Composite Weight (g)
SP07E	16	LW3-SP06W-16	8/30/2007	90	9.5	Y	X	306.2
	17	LW3-SP06W-17	8/30/2007	91	8.6	Y	X	
	18	LW3-SP06W-18	8/30/2007	87	7.2	N		
	19	LW3-SP06W-19	8/30/2007	93	7.9	Y	X	
	20	LW3-SP06W-20	8/31/2007	112	16.3	Y	X	
	21	LW3-SP06W-21	8/31/2007	90	7.7	Y	X	
	22	LW3-SP06W-22	9/4/2007	98	12.5	Y	X	
	23	LW3-SP06W-23	9/4/2007	102	12.2	Y	X	
	24	LW3-SP06W-24	9/4/2007	94	9.9	Y	X	
	25	LW3-SP06W-25	9/10/2007	91	6.7	Y	X	
	26	LW3-SP06W-26	9/10/2007	98	11.6	Y	X	
	27	LW3-SP06W-27	9/10/2007	92	8.2	Y	X	
	28	LW3-SP06W-28	9/10/2007	85	9.8	N		
	29	LW3-SP06W-29	9/10/2007	94	12	Y	X	
	01	LW3-SP07E-01	8/29/2007	164	65.6	Y	X	
	02	LW3-SP07E-02	8/30/2007	77	6.1	N		
	03	LW3-SP07E-03	9/4/2007	97	8.6	Y	X	
	04	LW3-SP07E-04	9/5/2007	121	21.9	Y	X	
	05	LW3-SP07E-05	9/5/2007	173	76.6	Y	X	
	06	LW3-SP07E-06	9/5/2007	90	10.1	Y	X	
	07	LW3-SP07E-07	9/5/2007	85	7.5	N		
	08	LW3-SP07E-08	9/7/2007	139	31.8	Y	X	
	09	LW3-SP07E-09	9/7/2007	91	11.9	Y	X	
	10	LW3-SP07E-10	9/10/2007	124	25	Y	X	
	11	LW3-SP07E-11	9/20/2007	126	19	Y	X	
	12	LW3-SP07E-12	9/20/2007	91	8.4	Y	X	
SP07W	13	LW3-SP07E-13	9/21/2007	127	27.3	Y	X	
	01	LW3-SP07W-01	9/6/2007	103	12.9	Y	X	195.8
	02	LW3-SP07W-02	9/7/2007	118	24.1	Y	X	
	03	LW3-SP07W-03	9/7/2007	101	14.3	Y	X	
	04	LW3-SP07W-04	9/7/2007	109	18.5	Y	X	
	05	LW3-SP07W-05	9/7/2007	90	12	Y	X	
	06	LW3-SP07W-06	9/7/2007	88	19	N		
SP08E	07	LW3-SP07W-07	9/11/2007	138	34.9	Y	X	318.5
	08	LW3-SP07W-08	9/11/2007	121	23.1	Y	X	
	09	LW3-SP07W-09	9/19/2007	112	15.1	Y	X	
	10	LW3-SP07W-10	9/26/2007	123	19.1	Y	X	
	11	LW3-SP07W-11	9/27/2007	126	21.8	Y	X	
	01	LW3-SP08E-01	8/28/2007	115	17.2	Y	X	
	02	LW3-SP08E-02	8/28/2007	98	12.5	Y	X	
	03	LW3-SP08E-03	8/28/2007	104	15.6	Y	X	
	04	LW3-SP08E-04	8/28/2007	110	16.7	Y	X	
	05	LW3-SP08E-05	8/28/2007	83	6.4	N		
	06	LW3-SP08E-06	8/28/2007	117	18.6	Y	X	
	07	LW3-SP08E-07	8/28/2007	100	12.7	Y	X	
	08	LW3-SP08E-08	8/28/2007	106	14.6	Y	X	
	09	LW3-SP08E-09	8/28/2007	120	19.6	Y	X	
	10	LW3-SP08E-10	8/28/2007	104	12.1	Y	X	
	11	LW3-SP08E-11	8/28/2007	112	8.3	Y	X	
	12	LW3-SP08E-12	8/29/2007	82	6.2	N		
	13	LW3-SP08E-13	8/29/2007	147	38.7	Y	X	
	14	LW3-SP08E-14	8/30/2007	107	15.8	Y	X	
	15	LW3-SP08E-15	8/30/2007	106	14.5	Y	X	
	16	LW3-SP08E-16	8/30/2007	91	9.1	Y	X	
SP08W	17	LW3-SP08E-17	8/30/2007	88	7.8	N		236.7
	18	LW3-SP08E-18	8/30/2007	92	7.5	Y	X	
	19	LW3-SP08E-19	8/30/2007	133	34.2	Y	X	
	20	LW3-SP08E-20	9/4/2007	113	17.4	Y	X	
	21	LW3-SP08E-21	9/4/2007	130	22.8	Y	X	
	22	LW3-SP08E-22	9/4/2007	106	10.6	Y	X	
	01	LW3-SP08W-01	8/31/2007	90	9.7	Y	X	
	02	LW3-SP08W-02	8/31/2007	128	25.7	Y	X	
	03	LW3-SP08W-03	8/31/2007	125	25.6	Y	X	
	04	LW3-SP08W-04	8/31/2007	112	19.2	Y	X	
	05	LW3-SP08W-05	8/31/2007	158	43.5	Y	X	
	06	LW3-SP08W-06	9/11/2007	119	16.1	Y	X	
	07	LW3-SP08W-07	9/12/2007	119	22.2	Y	X	
	08	LW3-SP08W-08	9/21/2007	128	23.7	Y	X	
	09	LW3-SP08W-09	9/12/2007	144	33.2	Y	X	

Station ID	Fish Number	Fish ID	Date of Collection	Length (mm)	Weight, Whole Fish (g)	Length ≥ 90 mm?	Include in composite?	Composite Weight (g)	
SP09W	10	LW3-SP08W-10	9/21/2007	111	17.8	Y	X		
	01	LW3-SP09W-01	9/13/2007	131	30.3	Y	X	273.9	
	02	LW3-SP09W-02	9/14/2007	133	27.2	Y	X		
	03	LW3-SP09W-03	9/14/2007	143	37.9	Y	X		
	04	LW3-SP09W-04	9/18/2007	118	22.5	Y	X		
	05	LW3-SP09W-05	9/20/2007	123	25.1	Y	X		
	06	LW3-SP09W-06	9/20/2007	132	29.9	Y	X		
	07	LW3-SP09W-07	9/21/2007	126	24.5	Y	X		
	08	LW3-SP09W-08	9/21/2007	115	23	Y	X		
SP10E	09	LW3-SP09W-09	9/25/2007	117	18.3	Y	X		
	10	LW3-SP09W-10	9/25/2007	139	35.2	Y	X		
	01	LW3-SP10E-01	9/18/2007	166	62.5	Y	X	456.3	
	02	LW3-SP10E-02	9/18/2007	151	40.1	Y	X	312.6	without fish LW3-SP10E-06
	03	LW3-SP10E-03	9/18/2007	126	28.1	Y	X		
	04	LW3-SP10E-04	9/18/2007	112	21.2	Y	X		
	05	LW3-SP10E-05	9/18/2007	101	12.8	Y	X		
	06	LW3-SP10E-06	9/19/2007	199	143.7	Y	X		
	07	LW3-SP10E-07	9/19/2007	142	38.1	Y	X		
	08	LW3-SP10E-08	9/19/2007	149	36.3	Y	X		
	09	LW3-SP10E-09	9/19/2007	127	26.8	Y	X		
	10	LW3-SP10E-10	9/19/2007	110	20.0	Y	X		
SP10W	11	LW3-SP10E-11	9/19/2007	108	15.4	Y	X		
	12	LW3-SP10E-12	9/19/2007	98	11.3	Y	X		
	01	LW3-SP10W-01	9/12/2007	148	46.2	Y	X	397.7	
	04	LW3-SP10W-04	9/20/2007	124	26.6	Y	X	251.3	without fish LW3-SP10W-06
	05	LW3-SP10W-05	9/20/2007	138	32.0	Y	X		
	06	LW3-SP10W-06	9/21/2007	199	146.4	Y	X		
	07	LW3-SP10W-07	9/21/2007	127	24.8	Y	X		
	08	LW3-SP10W-08	9/21/2007	119	23.4	Y	X		
	09	LW3-SP10W-09	9/21/2007	118	21.8	Y	X		
	10	LW3-SP10W-10	9/21/2007	129	30.5	Y	X		
	11	LW3-SP10W-11	9/21/2007	143	46	Y	X		
SP10W - Alt ¹	02	LW3-SP10W-Alt-02	9/19/2007	128	26.9	Y	NA	43.7	
SP11E	03	LW3-SP10W-Alt-03	9/19/2007	112	16.8	Y	NA		
	01	LW3-SP11E-01	9/14/2007	121	19.7	Y	X	171.6	
	02	LW3-SP11E-02	9/14/2007	100	10.1	Y	X		
	03	LW3-SP11E-03	9/14/2007	112	12.3	Y	X		
	04	LW3-SP11E-04	9/14/2007	104	8.7	Y	X		
	05	LW3-SP11E-05	9/19/2007	110	18.6	Y	X		
	06	LW3-SP11E-06	9/25/2007	99	10.8	Y	X		
	07	LW3-SP11E-07	9/25/2007	115	18	Y	X		
	08	LW3-SP11E-08	9/25/2007	103	14.7	Y	X		
	09	LW3-SP11E-09	9/25/2007	124	22.8	Y	X		
	10	LW3-SP11E-10	9/27/2007	108	15.8	Y	X		
SP12E	11	LW3-SP11E-11	9/27/2007	107	12.5	Y	X		
	12	LW3-SP11E-12	9/28/2007	89	7.6	N ²	X		
	01	LW3-SP12E-01	9/5/2007	186	126.2	Y	X	327.9	
	02	LW3-SP12E-02	9/6/2007	147	46.6	Y	X	201.7	without fish LW3-SP12E-01
	03	LW3-SP12E-03	9/6/2007	128	16.8	Y	X		
	04	LW3-SP12E-04	9/6/2007	122	23.8	Y	X		
	05	LW3-SP12E-05	9/6/2007	124	20.7	Y	X		
	06	LW3-SP12E-06	9/6/2007	106	13.6	Y	X		
	07	LW3-SP12E-07	9/6/2007	106	13.4	Y	X		
	08	LW3-SP12E-08	9/6/2007	106	14.3	Y	X		
	09	LW3-SP12E-09	9/6/2007	115	19.2	Y	X		
	10	LW3-SP12E-10	9/6/2007	101	11.2	Y	X		
SP12W ¹ SP12W - Alt	11	LW3-SP12E-11	9/6/2007	107	14.1	Y	X		
	12	LW3-SP12E-12	9/6/2007	90	8.0	Y	X		
	01	LW3-SP12W-01	9/14/2007	131	29.9	Y	NA	29.9	
	02 (Alt)	LW3-SP12W-Alt-02	9/18/2007	136	35.1	Y	X	466.7	
	03 (Alt)	LW3-SP12W-Alt-03	9/18/2007	102	13	Y	X		
	04 (Alt)	LW3-SP12W-Alt-04	9/18/2007	96	9.6	Y	X		
	05 (Alt)	LW3-SP12W-Alt-05	9/18/2007	92	8.4	Y	X		
	06 (Alt)	LW3-SP12W-Alt-06	9/18/2007	102	10.9	Y	X		
	07 (Alt)	LW3-SP12W-Alt-07	9/18/2007	90	7.8	Y	X		
	08 (Alt)	LW3-SP12W-Alt-08	9/18/2007	96	8.1	Y	X		
	09 (Alt)	LW3-SP12W-Alt-09	9/18/2007	93	6.6	Y	X		
	10 (Alt)	LW3-SP12W-Alt-10	9/18/2007	88	6.2	N			
	11 (Alt)	LW3-SP12W-Alt-11	9/19/2007	120	19.8	Y	X		

Station ID	Fish Number	Fish ID	Date of Collection	Length (mm)	Weight, Whole Fish (g)	Length ≥ 90 mm?	Include in composite?	Composite Weight (g)
	12 (Alt)	LW3-SP12W-Alt-12	9/19/2007	123	22.6	Y	X	
	13 (Alt)	LW3-SP12W-Alt-13	9/19/2007	98	10.4	Y	X	
	14 (Alt)	LW3-SP12W-Alt-14	9/19/2007	115	14.8	Y	X	
	15 (Alt)	LW3-SP12W-Alt-15	9/19/2007	113	12.6	Y	X	
	16 (Alt)	LW3-SP12W-Alt-16	9/19/2007	93	10.9	Y	X	
	17 (Alt)	LW3-SP12W-Alt-17	9/19/2007	95	9.3	Y	X	
	18 (Alt)	LW3-SP12W-Alt-18	9/19/2007	87	6.9	N		
	19 (Alt)	LW3-SP12W-Alt-19	9/19/2007	86	6.6	N		
	20 (Alt)	LW3-SP12W-Alt-20	9/19/2007	84	6.6	N		
	21 (Alt)	LW3-SP12W-Alt-21	9/20/2007	129	22.7	Y	X	
	22 (Alt)	LW3-SP12W-Alt-22	9/20/2007	131	26.9	Y	X	
	23 (Alt)	LW3-SP12W-Alt-23	9/20/2007	128	24.7	Y	X	
	24 (Alt)	LW3-SP12W-Alt-24	9/20/2007	120	22.2	Y	X	
	25 (Alt)	LW3-SP12W-Alt-25	9/20/2007	123	21.8	Y	X	
	26 (Alt)	LW3-SP12W-Alt-26	9/20/2007	123	18.2	Y	X	
	27 (Alt)	LW3-SP12W-Alt-27	9/20/2007	117	19.0	Y	X	
	28 (Alt)	LW3-SP12W-Alt-28	9/20/2007	112	14.4	Y	X	
	29 (Alt)	LW3-SP12W-Alt-29	9/20/2007	109	13.8	Y	X	
	30 (Alt)	LW3-SP12W-Alt-30	9/20/2007	115	20.8	Y	X	
	31 (Alt)	LW3-SP12W-Alt-31	9/20/2007	96	9.2	Y	X	
	32 (Alt)	LW3-SP12W-Alt-32	9/20/2007	98	11	Y	X	
	33 (Alt)	LW3-SP12W-Alt-33	9/20/2007	96	7.1	Y	X	
	34 (Alt)	LW3-SP12W-Alt-34	9/20/2007	93	8.6	Y	X	
	35 (Alt)	LW3-SP12W-Alt-35	9/20/2007	93	9.1	Y	X	
	36 (Alt)	LW3-SP12W-Alt-36	9/20/2007	96	8.5	Y	X	
	37 (Alt)	LW3-SP12W-Alt-37	9/20/2007	95	8.8	Y	X	

¹ Locations SP01E, SP10W-Alt, and SP12W were abandoned in preference to locations SP01E-Alt, SP10W, and SP12W-Alt. Fishing success was greater at the alternate locations for SP01E and SP12W, and at the original location for SP10W. Sculpin from the abandoned locations will not be included in the composites.

² Fish number LW3-SP11E-12 will be included in the composite at location SP11E despite being slightly below the target size because of the limited sample mass obtained at this location.

Appendix A11

EPA. 2007. EPA email to Lower Willamette Group dated November 2, 2007 (from E. Blischke to J. McKenna, R. Wyatt, and R. Applegate) regarding Round 3B fish compositing. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

From: Blischke.Eric@epamail.epa.gov
[mailto:Blischke.Eric@epamail.epa.gov]
Sent: Friday, November 02, 2007 4:47 PM
To: Jim McKenna; Bob Wyatt; Rick Applegate
Cc: grevelas@integral-corp.com; johnt@windwardenv.com; laurakennedy@kennedyJenks.com;
Humphrey.Chip@epamail.epa.gov; Shephard.Burt@epamail.epa.gov;
Davoli.Dana@epamail.epa.gov; Jessica Pisano; Valerie Oster
Subject: Round 3B Fish Compositing

EPA has reviewed the proposed fish sample compositing approaches. These are summarized below:

Crayfish: EPA provided comments on this previously; the approach proposed by the LWG is acceptable.

Sculpin: In general, the approach proposed by the LWG is acceptable. However, EPA recommends the exclusion of 1 - 2 fish for three of the composites due to substantial differences in size range:

SP10E: Sample SP10E-06 should be excluded. This fish weighs 143.7 g and is significantly larger than the other fish in the composite. This will reduce the total sample mass to 312.6 g.
SP10W: Sample SP10W-06 should be excluded. This fish weighs 146.4 g and is significantly larger than the other fish in the composite. This will reduce the total sample mass to 251.3 g.
SP12E: The largest (SP12E-01) and the smallest (SP12E-12) fish in the composite should be excluded. These are significantly larger and smaller than the remaining fish in the composite. This will reduce the total sample mass to 193.7 g. EPA understands that this still meets our target tissue mass (175 g) since we are not doing PBDEs on sculpin.

Smallmouth Bass: EPA reviewed the approach developed by the LWG previously. Comments were submitted to the LWG in an email dated October 15, 2007. The LWG responded to EPA's counter proposal in an email from Laura Kennedy dated October 25, 2007. A summary of EPA's response to the three key points in Laura's email is provided below:

- 1) EPA acknowledges that the size range proposed by EPA is not consistent with the FSP which specified a size range of 225 to 355 mm and that larger fish would be included if insufficient numbers of fish within the target range were collected. However, EPA believes that it under estimated the size of the fish that could be expected to be caught during the sampling effort and which are allowed to caught according to ODFW fishing regulations (e.g., 3 fish per day larger than 15 inches).
- 2) EPA disagrees that including a few fish larger than 355 mm will result in a exposure concentration that is inconsistent with the arithmetic average that human consumers of bass will be exposed to. All the fish are within the allowable size range according to State of Oregon fishing regulations. Although smaller fish were caught during the Round 3B sampling effort, EPA believes that fishers will preferentially keep larger fish and, as a result, it is appropriate to include fish larger than 355 mm in the composite since many fish above this length were taken during the collection effort.
- 3) EPA agrees that, consistent with RAGS Part A, it is the combination of intake variable values that should result in an estimate of the reasonable maximum exposure, not the use of the maximum value for each the individual intake variables for the human health risk assessment. However, the bass will be evaluated in the ecological risk assessment as well. The ecological risk assessment is not bound by the narrowness of the length range as is the human health risk assessment. Furthermore,

the ecological risk assessment is designed to evaluate risks to the maximally exposed receptor, which for bass is likely the largest, oldest fish we can collect. The food web model is best at predicting average chemical concentrations in fish. The best empirical data for calibrating and validating the food web model to estimate the average chemical concentration is a range of sizes, including larger fish. EPA recognizes that the multiple objectives of the Round 3B fish sampling makes it difficult to develop one approach that will optimize all objectives. Consequently, EPA recommends a focused conversation to discuss the LWG and EPA proposal with the goal of including some fish larger than 355 mm while at the same time attempting to maintain the 0.75 ratio requirement.

Carp: The LWG proposal for RM 0 - 4 and RM 4 - 8 are acceptable. However, regarding the carp collected between RM 8 - 12, EPA believes that the carp collected from Swan Island Lagoon should be composited as a separate sample. This will facilitate the foodweb model looking at Swan Island Lagoon as a subset of the site. Furthermore, previous research on carp movements have found that they can exhibit both high site fidelity and high mobility (Penne and Pierce 2007). EPA proposes compositing the carp collected between RM 8 and 12 according to the following:

- Composite 1: CP0812-9, CP0812-8, CP0812-4, CP0812-6 and CP0812-2
- average fish length = 594.2 mm.
- Composite 2: CP0812-10, CP0812-3, CP0812-7, CP0812-1 and CP0812-5
- average fish length = 597.6 mm.
- Composite 3 (all from SIL): CP0812-15, CP0812-13, CP0812-11, CP0812-12 and CP0812-14 - average fish length = 530.4 mm.

This will result in a good distribution of carp from the main stem with respect to capture location and size range and similar average length. This approach does result in a data set whereby the mainstem lengths are different from the SIL lengths. However, under the LWG proposal, the RM 8 - 12 composites, with average lengths ranging from 571.6 - 577.4 mm, are different than the other composites.

Please let me know if you have any questions or comments on this approach.

Thanks, Eric

Appendix A12

EPA. 2007. EPA email and attachments to Lower Willamette Group dated November 29, 2007 (from E. Blischke to L. Kennedy) regarding Round 3B Bass and Carp Compositing. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

From: Blischke.Eric@epamail.epa.gov
Sent: Thursday, November 29, 2007 10:23 AM
To: Laura Kennedy
Cc: Gene Revelas; Jim McKenna; John Toll; Jessica Pisano; Maja Tritt; Rick Applegate; Bob Wyatt; voster@anchorenv.com
Subject: RE: Round 3B Bass and Carp Compositing
Attachments: R3B_carp_composites_11-28-07.xls; R3B_bass_composites_11-28-07.xls



R3B_carp_compositR3B_bass_composit
es_11-28-07.x... es_11-28-07.x...

Laura, thanks for providing the attached summary. EPA agrees with the compositing schemes described below and agrees that they are consistent with the EPA approved Round 3B fish and invertebrate FSP. The fish may be sent to the laboratory for compositing at your earliest convenience.

Let me know if you have any questions.

Eric

"Laura Kennedy"
<LauraKennedy@KennedyJenks.com>

11/28/2007 05:18
PM

To
Eric Blischke/R10/USEPA/US@EPA
cc
"Jessica Pisano"
<jpisano@anchorenv.com>,
<voster@anchorenv.com>, "Gene Revelas"
<grevelas@integral-corp.com>,
"John Toll"
<johnt@windwardenv.com>, "Maja Tritt"
<mtritt@integral-corp.com>, "Bob Wyatt" <rjw@nwnatural.com>, "Jim McKenna"
<jim.mckenna@portofportland.com>,
"Rick Applegate"
<ricka@bes.ci.portland.or.us>
Subject
RE: Round 3B Bass and Carp Compositing

Eric,

Composite schemes for bass and carp are attached. These composite schemes are consistent with the approved FSP and your email below. The LWG intends to begin shipping these bass

and carp composites to the laboratory on 12/4 for homogenization and analysis. Please respond by 11/30 indicating whether EPA approves these composites.

Thank you,
Laura

-----Original Message-----

From: Blischke.Eric@epamail.epa.gov
[mailto:Blischke.Eric@epamail.epa.gov]
Sent: Monday, November 26, 2007 4:40 PM
To: Laura Kennedy
Subject: Re: Round 3B Bass and Carp Compositing

Laura, EPA is prepared to agree to the compositing according to the approved FSP. However, EPA would like to point out that compositing the bass samples as you propose - composite the five biggest fish (i.e., greatest length) within the target size range for each location - will result in a smallest fish to largest fish ratio of less than 0.75 for three of the samples - SB04E, SB04W and SB11W. However, by including fish > 355 mm in these three samples (one fish in SW04E and SB04W and two fish in SB11W), all ratios will be greater than 0.75 with the exception of SB06E which will have a ratio of 0.74.

EPA believes that this approach is also consistent with the approved FSP.

Eric

"Laura Kennedy"
<LauraKennedy@KennedyJenks.com>

11/26/2007 03:58
PM

To
Eric Blischke/R10/USEPA/US@EPA
cc
<voster@anchorenv.com>, "Jessica
Pisano" <jpisano@anchorenv.com>,
"Gene Revelas"
<grevelas@integral-corp.com>,
"John Toll"
<johnt@windwardenv.com>, "Bob
Wyatt" <rjw@nwnatural.com>, "Jim
McKenna"
<jim.mckenna@portofportland.com>,
"Rick Applegate"
<ricka@bes.ci.portland.or.us>
Subject
Round 3B Bass and Carp
Compositing

Eric,

Thank you for further discussing EPA's proposals for the bass and carp composites with me last week. As we discussed, the major concern with EPA's proposals is that they represent a change to the approved Round 3B biota FSP. As a follow up to our conversation, this mail provides the LWG's position on the bass and carp composites:

For bass:

- The target size range was originally defined in the approved Round 1 FSP. The same maximum size was included in the approved Round 3B FSP.

- The target size range was defined to be most representative of the size range available for fishers to catch and consume in Portland Harbor, and is therefore most representative of ongoing consumption and is still considered protective of human health. As we discussed, it is appropriate and consistent with guidance to use an average concentration in the HHRA.

- The LWG's recommended composite scheme is in accordance with the approved FSP.

- The recommended composite scheme is to composite the five biggest fish (i.e., greatest length) within the target size range for each location.

For carp:

- The approved Round 3B FSP states that an attempt will be made to collect carp throughout a fishing zone, as was done in Round 1.

- Given the home range of carp, it is not defensible to evaluate carp over an area the size of Swan Island Lagoon because it is likely that fish captured in the lagoon have spent substantial portion of their time outside the lagoon. Therefore, exposure and risks associated with carp captured from the lagoon cannot be attributed solely to the sediments there. The LWG has included fish species with smaller home ranges in the modeling efforts for the lagoon because the greater site-specificity of exposures for such species can lead to more applicable conclusions regarding the source of chemicals in fish tissues.

- EPA has previously supported modeling only small home range fish for Swan Island Lagoon: EPA's March 10, 2006 comments on the 2005 LWG FWM tech memo stated (in Comment 11) that the LWG's concern about poor model predictions at smaller spatial scales (Swan Island Lagoon) could be addressed by modeling only small home range species in model runs of spatial scales smaller than the ISA. The LWG agreed with EPA's comment and therefore did not model carp, sucker, or pikeminnow for Swan Island Lagoon in the Round 2 report. These larger home range species were only modeled on a site wide basis.

- The LWG's recommended composite scheme is in accordance with the approved FSP and was previously submitted to EPA.

- The recommended composite scheme is to create three similar composites for RM 8-12 (i.e., three composites that include fish collected both within Swan Island Lagoon and the mainstem). EPA already approved the composite schemes for RM 0-4 and 4-8 in an email on November 11.

Therefore, unless we hear otherwise from EPA, the LWG will proceed with the bass and carp composites per the agreed-upon Round 3B biota FSP.
Please let me know if you have any questions.

- Laura

See attached file: R3B_carp_composites_11-28-07.xls) (See attached file: R3B_bass_composites_11-28-07.xls)

Round 3B Carp Lengths and Composites

Target size range = 508-677 mm

						Lengths and Average Lengths for each composite		
Station ID	Fish ID	Length (mm)	Inside target size range?	Composite Number	Location	1	2	3
CP0004	LW3-CP0004-16	529	Y	2	0.7E	546	529	579 526
CP0004	LW3-CP0004-5	546	Y	1	0.7E			
CP0004	LW3-CP0004-4	579	Y	3	0.7E			
CP0004	LW3-CP0004-10	526	Y	3	1E			
CP0004	LW3-CP0004-11	622	Y	2	1E		622	
CP0004	LW3-CP0004-3	689	N	--	1E			
CP0004	LW3-CP0004-14	512	Y	2	3.25E	551 531 549 571	512	527 507 625
CP0004	LW3-CP0004-2	527	Y	3	3.25E			
CP0004	LW3-CP0004-17	529	Y	2	3.25E		529	
CP0004	LW3-CP0004-6	551	Y	1	3.25E			
CP0004	LW3-CP0004-13	507	N	3	3.3W			
CP0004	LW3-CP0004-12	531	Y	1	3.3W			
CP0004	LW3-CP0004-15	549	Y	1	3.5E			
CP0004	LW3-CP0004-7	556	Y	2	3.5E		556	
CP0004	LW3-CP0004-8	571	Y	1	3.5E			
CP0004	LW3-CP0004-9	625	Y	3	3.5E			
CP0004	LW3-CP0004-1	495	N	--	3.65E			
AVERAGE:		551				549.6	549.6	552.8
CP0408	LW3-CP0408-11	539	Y	3	4.5E	541 523 539 544 613	555 522 559	539 534 520 536 631
CP0408	LW3-CP0408-12	541	Y	1	4.5E			
CP0408	LW3-CP0408-9	555	Y	2	5.2E			
CP0408	LW3-CP0408-2	523	Y	1	5.8W			
CP0408	LW3-CP0408-8	534	Y	3	6.8E			
CP0408	LW3-CP0408-4	520	Y	3	6.9W			
CP0408	LW3-CP0408-6	522	Y	2	6.9W			
CP0408	LW3-CP0408-7	539	Y	1	6.9W			
CP0408	LW3-CP0408-5	544	Y	1	6.9W			
CP0408	LW3-CP0408-3	559	Y	2	6.9W			
CP0408	LW3-CP0408-10	507	N	--	7.3W			
CP0408	LW3-CP0408-14	536	Y	3	7.3W	613	554 556	536 631
CP0408	LW3-CP0408-13	554	Y	2	7.4E			
CP0408	LW3-CP0408-16	556	Y	2	7.6W			
CP0408	LW3-CP0408-17	631	Y	3	7.6W			
CP0408	LW3-CP0408-15	613	Y	1	7.8W			
AVERAGE:		551				552	549.2	552
CP0812	LW3-CP0812-9	603	Y	1	10.7W	550 663 513 529	651 530 625 512	677 528 529
CP0812	LW3-CP0812-10	677	Y	3	11.9W			
CP0812	LW3-CP0812-3	528	Y	3	8.2W			
CP0812	LW3-CP0812-8	550	Y	1	8.3W			
CP0812	LW3-CP0812-7	651	Y	2	8.3W			
CP0812	LW3-CP0812-1	603	Y	3	9.7W			
CP0812	LW3-CP0812-4	530	Y	2	9.7W			
CP0812	LW3-CP0812-5	529	Y	3	9.8E			
CP0812	LW3-CP0812-6	625	Y	2	9.8E			
CP0812	LW3-CP0812-2	663	Y	1	9.8E			
CP0812	LW3-CP0812-15	512	Y	2	SIL	513	569	529
CP0812	LW3-CP0812-13	513	Y	1	SIL			
CP0812	LW3-CP0812-11	529	Y	3	SIL			
CP0812	LW3-CP0812-12	529	Y	1	SIL			
CP0812	LW3-CP0812-14	569	Y	2	SIL			
AVERAGE:		574				571.6	577.4	573.2

Summary of Proposed Bass for Composites

Target size range
Bass: 225-355 mm

Station ID	Fish Number	Date of Collection	Length (mm)	Proposed for Composite	Fish Length Ratio (smallest/largest)	Mean Length of Composite (mm)	Weight, Whole Fish (g)	Inside target size range?
Smallmouth Bass								
SB02E	4	9/11/07	312	x	0.75	266	525.0	Y
	2	9/4/07	269	x			286.5	Y
	5	9/11/07	259	x			233.3	Y
	3	9/7/07	257	x			243.0	Y
	6	9/11/07	234	x			205.4	Y
SB03E	1	9/4/07	220		0.76	274	171.5	N
	5	9/7/07	301	x			394.2	Y
	6	9/11/07	296	x			416.8	Y
	1	9/4/07	280	x			285.6	Y
	2	9/4/07	266	x			268.7	Y
	3	9/4/07	229	x			182.2	Y
	4	9/7/07	224				164.6	N
SB03W	7	9/11/07	223		0.77	284	176.3	N
	4	9/4/07	326	x			509.7	Y
	1	9/4/07	300	x			355.4	Y
	5	9/4/07	287	x			307.5	Y
	2	9/4/07	258	x			230.3	Y
SB04E	3	9/4/07	250	x	0.75	336	196.1	Y
	2	9/4/07	397	x			1034.7	N
	3	9/4/07	351	x			636.2	Y
	7	9/10/07	318	x			516.3	Y
	6	9/10/07	315	x			532.6	Y
	9	9/11/07	299	x			438.4	Y
	10	9/11/07	249				253.4	Y
	8	9/11/07	247				228.5	Y
	5	9/10/07	245				228.9	Y
	4	9/4/07	238				192.8	Y
SB04W	1	8/28/07	220		0.79	322	141.7	N (scaled)
	4	9/4/07	368	x			781.3	N
	3	9/4/07	356	x			718.5	N
	6	9/4/07	301	x			298.5	Y
	7	9/5/07	294	x			334.9	Y
	5	9/4/07	289	x			341.7	Y
	2	9/4/07	254				228.8	Y
SB05W	1	9/4/07	235		0.85	308	179.6	Y
	5	9/5/07	331	x			582.8	Y
	2	9/5/07	330	x			569.3	Y
	4	9/5/07	306	x			368.4	Y
	9	9/5/07	290	x			337.1	Y
	10	9/5/07	282	x			314.1	Y
	1	9/5/07	277				281.9	Y
	6	9/5/07	269				219.6	Y
	3	9/5/07	246				207.1	Y
	8	9/5/07	220				148.1	N
SB06E	7	9/5/07	218		0.74	271	142.1	N
	2	9/6/07	308	x			386.7	Y

Station ID	Fish Number	Date of Collection	Length (mm)	Proposed for Composite	Fish Length Ratio (smallest/largest)	Mean Length of Composite (mm)	Weight, Whole Fish (g)	Inside target size range?
SB06W	7	9/10/07	283	x	0.89	269	276.9	Y
	5	9/10/07	279	x			312.2	Y
	1	9/5/07	254	x			208.9	Y
	8	9/10/07	229	x			164.2	Y
	6	9/10/07	225				150.6	Y
	1	9/5/07	372				718.2	N
	3	9/5/07	368				676.9	N
	9	9/5/07	289	x			327.8	Y
	8	9/5/07	280	x			278.0	Y
	6	9/5/07	264	x			221.2	Y
	2	9/5/07	257	x			186.2	Y
	7	9/5/07	257	x			210.8	Y
	4	9/5/07	251				225.4	Y
	5	9/5/07	231				167.3	Y
SB07E	1	9/5/07	357	x	0.78	327	617.0	N
	3	9/5/07	351	x			589.8	Y
	6	9/11/07	325	x			522.3	Y
	5	9/5/07	324	x			464.7	Y
	2	9/5/07	277	x			286.1	Y
	4	9/5/07	259				243.2	Y
	7	9/11/07	253				213.4	Y
	7	9/6/07	334	x			469.3	Y
	5	9/6/07	308	x			430.4	Y
	6	9/6/07	305	x			389.2	Y
	8	9/6/07	302	x			416.9	Y
	1	9/6/07	299	x			339.2	Y
	2	9/6/07	287				336.3	Y
	3	9/6/07	272				268.2	Y
SB08E	4	9/6/07	239		0.80	302	143.7	Y
	2	9/5/07	320	x			531.3	Y
	4	9/5/07	315	x			461.7	Y
	3	9/5/07	311	x			444.0	Y
	5	9/5/07	306	x			443.7	Y
	1	9/5/07	256	x			216.0	Y
	5	9/6/07	365				619.0	N
	8	9/6/07	362				630.4	N
	6	9/6/07	309	x			430.7	Y
	10	9/6/07	299	x			384.9	Y
	11	9/10/07	255	x			224.1	Y
	12	9/11/07	249	x			212.0	Y
	9	9/6/07	234	x			184.4	Y
	7	9/6/07	228				176.9	Y
SB09E	4	9/6/07	336	x	0.79	310	557.8	Y
	5	9/6/07	329	x			587.5	Y
	2	9/6/07	319	x			454.6	Y
	1	9/6/07	298	x			379.0	Y
	6	9/11/07	267	x			246.0	Y
	3	9/6/07	227				161.4	Y
	6	9/6/07	354	x			719.9	Y
	1	8/31/07	351	x			605.9	N (scaled)
SB09W	7	9/10/07	283	x	0.86	329	276.9	Y
	5	9/10/07	279	x			312.2	Y
	1	9/5/07	254	x			208.9	Y
	8	9/10/07	229	x			164.2	Y
	6	9/10/07	225				150.6	Y
	1	9/5/07	372				718.2	N
	3	9/5/07	368				676.9	N
	9	9/5/07	289	x			327.8	Y
	8	9/5/07	280	x			278.0	Y
	6	9/5/07	264	x			221.2	Y
	2	9/5/07	257	x			186.2	Y
	7	9/5/07	257	x			210.8	Y
	4	9/5/07	251				225.4	Y
	5	9/5/07	231				167.3	Y

Station ID	Fish Number	Date of Collection	Length (mm)	Proposed for Composite	Fish Length Ratio (smallest/largest)	Mean Length of Composite (mm)	Weight, Whole Fish (g)	Inside target size range?
SB10E	8	9/11/07	318	x	0.93	327	390.8	Y
	2	8/31/07	314	x			407.2	Y
	7	9/6/07	306	x			382.3	Y
	4	9/5/07	267				262.6	Y
	5	9/6/07	256				214.5	Y
	3	8/31/07	231				154.8	Y
	1	9/6/07	365				259.9	N
	6	9/11/07	334	x			559.3	Y
	7	9/11/07	334	x			496.9	Y
	3	9/6/07	328	x			580.3	Y
	8	9/14/07	328	x			521.0	Y
	2	9/6/07	312	x			458.7	Y
	5	9/6/07	308				384.6	Y
	4	9/6/07	231				157.4	Y
SB10W	3	9/7/07	403		0.77	283	843.3	N
	8	9/14/07	328	x			521.0	Y
	7	9/10/07	306	x			363.7	Y
	9	9/17/07	274	x			264.5	Y
	1	9/5/07	258	x			215.0	Y
	4	9/7/07	251	x			212.8	Y
	6	9/10/07	246				198.4	Y
	5	9/10/07	227				166.9	Y
	2	9/7/07	220				133.6	N
	6	9/6/07	314	x			478.9	Y
	5	9/6/07	266	x			289.2	Y
	3	9/6/07	263	x			295.3	Y
	1	9/6/07	261	x			233.2	Y
	4	9/6/07	251	x			212.7	Y
SB11E	7	9/6/07	234		0.80	271	183.5	Y
	8	9/6/07	223				145.3	N
	2	9/6/07	220				144.7	N
	3	9/7/07	371	x			269.3	N
	6	9/7/07	369	x			263.9	N
	9	9/11/07	338	x			511.5	Y
	2	9/7/07	327	x			576.6	Y
	7	9/7/07	286	x			332.9	Y
	8	9/7/07	259				234.5	Y
	5	9/7/07	239				185.5	Y
	10	9/11/07	238				178.2	Y
	4	9/7/07	225				165.8	Y
	1	9/7/07	223				158.5	N

Notes

☐ Fish was scaled prior to filleting

Appendix A13

EPA. 2007. EPA email to Lower Willamette Group dated December 12, 2007 (from E. Blischke to M. Tritt) regarding Bass composite at location SB10E. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

From: Blischke.Eric@epamail.epa.gov
Sent: Wednesday, December 12, 2007 8:13 AM
To: Maja Tritt
Cc: Christine Hawley; Claudia Powers; David Ashton; Gene Revelas; Jim McKenna; John Toll; Jessica Pisano; Laura Kennedy; Rick Applegate; Bob Wyatt; Valerie Oster
Subject: Re: Bass composite at location SB10E

Maja, the proposed revision is consistent with the FSP and our rationale for compositing as documented in Laura Kennedy's November 28, 2007 email. We agree to the compositing approach outlined for SB10E below.

If you have any questions about this, let me know.

Thanks, Eric

"Maja Tritt"
<mtritt@integral-corp.com>

12/11/2007 11:06 AM

To
Eric Blischke/R10/USEPA/US@EPA
cc
"Bob Wyatt" <rjw@nwnatural.com>,
"Christine Hawley"
<chawley@integral-corp.com>,
"David Ashton"
<david.ashton@portofportland.com>
, "Gene Revelas"
<grevelas@integral-corp.com>,
"Jessica Pisano"
<jpisano@anchorenv.com>, "Jim
McKenna"
<jim.mckenna@portofportland.com>,
"Rick Applegate"
<RickA@bes.ci.portland.or.us>,
"Valerie Oster"
<voster@anchorenv.com>, "Laura
Kennedy"
<LauraKennedy@KennedyJenks.com>,
"John Toll"
<johnt@windwardenv.com>, "Claudia
Powers" <Ckp@aterwynne.com>
Subject
Bass composite at location SB10E

Eric,

We have discovered an error in the spreadsheet of smallmouth bass composites that necessitates selection of a new fish for inclusion in the composite at location SB10E. Due to a tabulation error, smallmouth bass number 8 from location SB10W was entered into the spreadsheet for location SB10E as well as location SB10W. This fish was selected for inclusion in the composite for location SB10E but is obviously not really available at

that location. We suggest including fish number 5 as the fifth fish in composite SB10E. As shown in the attached spreadsheet, this fish meets the bass length criteria and its length is

72 percent of the length of the largest fish, well within the target of 75 percent. The average fish length in this revised composite is 323 mm.

Please let us know if you do not agree with this composite. The fish samples have been provided to CAS and are scheduled to be homogenized beginning this week.

Thank you very much.

Maja

Maja Tritt
Senior Scientist
Integral Consulting Inc.
7900 SE 28th Street, Suite 410
Mercer Island, WA 98040
Phone: 206-957-0353
Fax: 206-230-9601

mtritt@integral-corp.com
www.integral-corp.com

This communication is made under the framework of the LWG Participation Agreement and in the parties' common interests in meeting LWG member obligations under the Administrative Order on Consent and in anticipation of litigation concerning liability for the Portland Harbor Superfund site. This communication is intended and believed by the parties to be part of an ongoing and joint effort to develop and maintain a common legal strategy and contains strategies, work product and legal advice within the "common interest" extension of the attorney-client privilege and the work product doctrine. This communication may include attorney-client communications. With respect to communications by private LWG members to public members, those communications are with the expectation that they will be kept confidential by the public entities. The information is intended to be for the use of the individual or entity named above. If you are not the intended recipient, please be aware that any disclosure, copying, distribution or use of the contents of this information is prohibited.

If you have received this electronic transmission in error, please notify us by electronic mail at mtritt@integral-corp.com.

[attachment "R3B_bass_composites_11-28-07 -SB10E_rev.xls" deleted by Eric Blischke/R10/USEPA/US]

Appendix A14

LWG. 2007. Lower Willamette Group email and attachments to EPA dated October 11, 2007 (from G. Revelas to E. Blischke, C. Humphrey, and J. Goulet) regarding Target Sculpin/Crayfish Collocated Sediment Sample Target Locations. Lower Willamette Group, Portland, OR.

From: Gene Revelas
Sent: Thursday, October 11, 2007 8:33 AM
To: 'Blischke.Eric@epamail.epa.gov'; Chip Humphrey; Joe Goulet (goulet.joe@epa.gov)
Cc: Maja Tritt; Ian Stupakoff; Bob Wyatt; Jessica Pisano; Jim McKenna (Jim.McKenna@portofportland.com); Rick Applegate; Valerie Oster (voster@anchorenv.com)
Subject: Target Sculpin/Crayfish Collocated Sediment Sample Target Locations
Attachments: Sculpin_Crayfish CollocSedLocs 20071011.xls; R3B_CollocSeds_10112007_compressed.pdf

Eric/Chip

As requested last week, attached find a map set and target sampling location table for the crayfish/sculpin collocated sediment sampling. The maps show the shoreline areas (red lines) that define each sampled location. The hatched polygon areas are an approximation of the fishing zone for each area. The green dots offshore are the target grab sample locations. Per the FSP, each sample for analysis will be a composite of a single grab from each of those three locations. The green dots are situated along a line offshore that represents the actual locations that the set lines/crayfish pots were deployed in each area. We would like to initiate this sampling program next week, so please contact me by the end of this week if you have any questions or concerns.

Note: I compressed the .pdf for emailing, let me know if you want a higher resolution version and we'll post it.

Thanks,

Gene

Gene Revelas
Managing Scientist
Integral Consulting Inc.
1205 West Bay Drive NW
Olympia, WA 98502
ph. 360.705.3534
fax 360.705.3669
cell 360.870.4950

grevelas@integral-corp.com
www.integral-corp.com

Target Grab locations for collocated sculpin/crayfish sample collection - 10/11/2007

Sample_ID	X	Y	Type	Station
GCR01E-ALT-A	7621144.9	728401	Proposed Grab	GCR01E-ALT
GCR01E-ALT-B	7621169.5	728410.1	Proposed Grab	GCR01E-ALT
GCR01E-ALT-C	7621194.1	728419.2	Proposed Grab	GCR01E-ALT
GCR05W-A	7621408.3	707827.2	Proposed Grab	GCR05W
GCR05W-B	7621380.7	707871.3	Proposed Grab	GCR05W
GCR05W-C	7621353.1	707915.4	Proposed Grab	GCR05W
GCR10W-A	7639582.8	692865.9	Proposed Grab	GCR10W
GCR10W-B	7639552.7	692911.6	Proposed Grab	GCR10W
GCR10W-C	7639522.6	692957.3	Proposed Grab	GCR10W
GCR12W-A	7645851.1	685840.5	Proposed Grab	GCR12W
GCR12W-B	7645873.2	685820.5	Proposed Grab	GCR12W
GCR12W-C	7645895.4	685800.5	Proposed Grab	GCR12W
GSP01E-A	7619717.3	727237.5	Proposed Grab	GSP01E
GSP01E-B	7619682.8	727212.3	Proposed Grab	GSP01E
GSP01E-C	7619648.2	727187.1	Proposed Grab	GSP01E
GCRSP01W-A	7618514.2	728014.5	Proposed Grab	GCRSP01W
GCRSP01W-B	7618469.3	727988.6	Proposed Grab	GCRSP01W
GCRSP01W-C	7618424.5	727962.7	Proposed Grab	GCRSP01W
GSP03E-A	7617518.2	717857.2	Proposed Grab	GSP03E
GSP03E-B	7617531.4	717798.8	Proposed Grab	GSP03E
GSP03E-C	7617544.7	717740.3	Proposed Grab	GSP03E
GSP04W-A	7618141.8	712651.9	Proposed Grab	GSP04W
GSP04W-B	7618122.9	712690	Proposed Grab	GSP04W
GSP04W-C	7618103.9	712728	Proposed Grab	GSP04W
GSP05E-A	7621743.8	709147.6	Proposed Grab	GSP05E
GSP05E-B	7621769.4	709108.7	Proposed Grab	GSP05E
GSP05E-C	7621795.1	709069.7	Proposed Grab	GSP05E
GCRSP06W-A	7624594.2	705308.6	Proposed Grab	GCRSP06W
GCRSP06W-B	7624630.6	705283.6	Proposed Grab	GCRSP06W
GCRSP06W-C	7624667.2	705257.5	Proposed Grab	GCRSP06W
GSP07E-A	7629638.6	703229.5	Proposed Grab	GSP07E
GSP07E-B	7629615.2	703267.9	Proposed Grab	GSP07E
GSP07E-C	7629591.7	703306.3	Proposed Grab	GSP07E
GSP07W-A	7628784.7	700403.4	Proposed Grab	GSP07W
GSP07W-B	7628812.1	700381.9	Proposed Grab	GSP07W
GSP07W-C	7628839.4	700360.3	Proposed Grab	GSP07W
GSP08E-A	7633698.4	701704.1	Proposed Grab	GSP08E
GSP08E-B	7633739.2	701675.6	Proposed Grab	GSP08E
GSP08E-C	7633780.1	701647.1	Proposed Grab	GSP08E
GCRSP08W-A	7633037.6	696988	Proposed Grab	GCRSP08W
GCRSP08W-B	7633080.8	696963.9	Proposed Grab	GCRSP08W
GCRSP08W-C	7633126	696937.7	Proposed Grab	GCRSP08W
GSP09W-A	7635279.9	695689	Proposed Grab	GSP09W
GSP09W-B	7635239.7	695730.3	Proposed Grab	GSP09W
GSP09W-C	7635195.7	695769.4	Proposed Grab	GSP09W
GSP10E-A	7639792.3	694825.2	Proposed Grab	GSP10E
GSP10E-B	7639812.2	694789.7	Proposed Grab	GSP10E
GSP10E-C	7639832	694754.1	Proposed Grab	GSP10E
GSP10W-A	7639809.2	692633.7	Proposed Grab	GSP10W

Target Grab locations for collocated sculpin/crayfish sample collection - 10/11/2007

Sample_ID	X	Y	Type	Station
GSP10W-B	7639839.8	692587.4	Proposed Grab	GSP10W
GSP10W-C	7639870.3	692541.2	Proposed Grab	GSP10W
GCRSP11E-A	7644327.6	689234.8	Proposed Grab	GCRSP11E
GCRSP11E-B	7644362.4	689219.6	Proposed Grab	GCRSP11E
GCRSP11E-C	7644397.1	689204.4	Proposed Grab	GCRSP11E
GCRSP12E-A	7646947.3	685755.1	Proposed Grab	GCRSP12E
GCRSP12E-B	7646981.4	685713.1	Proposed Grab	GCRSP12E
GCRSP12E-C	7647015.6	685671	Proposed Grab	GCRSP12E
GSP12W-ALT-A	7645639.1	686219.4	Proposed Grab	GSP12W-ALT
GSP12W-ALT-B	7645611.9	686269.6	Proposed Grab	GSP12W-ALT
GSP12W-ALT-C	7645584.6	686319.9	Proposed Grab	GSP12W-ALT

Map Document: (R:\GIS\GIS\Projects\Portland_Harbor\LWG_Map\Project\Bound3_Traffic_B0101_489138_CollocSedim_10082007.mxd)
2007.10.10 - 09:35:40

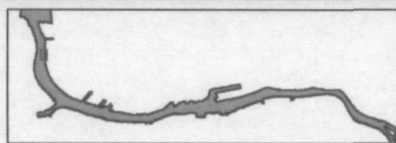


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solutions inc.

LWG
LOWER WILLAMETTE GROUP

FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RI/FS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 150 Feet



Map Features:
IAOPC_Boundary
Navigation Channel

Sample ID Codes
CA = clam
CP = carp
CR = crayfish
SP = sculpin
G = surface sediment grab
E = east
W = west

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Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
GSP01E



Legend

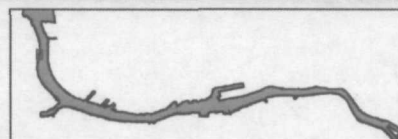
- Proposed Collocated Sediment Grab
- Shoreline as marked for sculpin/crayfish collection
- Approximate set line/crayfish pot fishing zone

integral
solutions inc.



FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 150 Feet



Map Features:

- IAOPC_Boundary
- Navigation Channel

Sediment ID Codes:
CA = clam
CP = carp
CR = crayfish
SP = sculpin
Q = surface sediment grab
E = east
W = west

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Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
GSP01W

LWG
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Legend

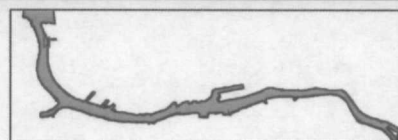
- Proposed Collocated Sediment Grab
- Shoreline as marked for sculpin/crayfish collection
- Approximate set line/crayfish pot fishing zone

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FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 150 Feet



Map Features:

- IAOPC_Boundary
- Navigation Channel

Sample ID Codes

- CA = clam
- CP = carp
- CR = crayfish
- SP = sculpin
- G = surface sediment grab
- S = steel
- W = weed

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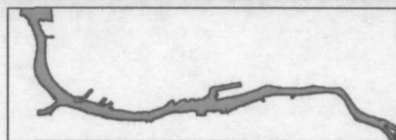
Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
GSP01W-ALT

LWG
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LWG
LOWER WILLAMETTE GROUP

0 50 100 150 Feet



Sample ID Codes
CA = clam
CP = carp
CR = crayfish
SP = sculpin
G = surface sediment grab
E = east
W = west

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Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
GSP03E



Legend

- Proposed Collocated Sediment Grab
- Shoreline as marked for sculpin/crayfish collection
- Approximate set line/crayfish pot fishing zone

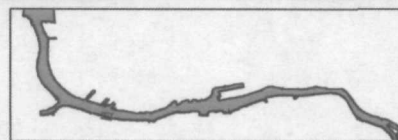
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solutions inc.



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FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 150 Feet



Map Features:

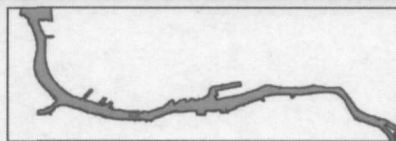
- IACPC_Boundary
- Navigation Channel

Sample ID Codes
CA = clam
CP = carp
CS = crayfish
SP = sculpin
Q = surface sediment grab
E = east
W = west

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**Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
GSP04W**





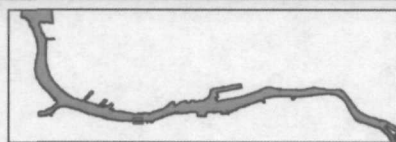
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- Proposed Collocated Sediment Grab
- Shoreline as marked for sculpin/crayfish collection
- Approximate set line/crayfish pot fishing zone



FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 150 Feet



Map Features:
IADPC_Boundary
Navigation Channel

Sample ID Codes
CA = clam
CP = carp
CR = crayfish
SP = sculpin
G = surface sediment grab
E = east
W = west

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Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
GCR05W

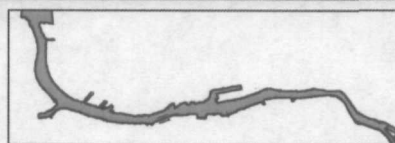


Legend

- Proposed Collocated Sediment Grab
- Shoreline as marked for sculpin/crayfish collection
- Approximate set line/crayfish pot fishing zone



FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers.
Bathymetry Information: David Evans and Associates, Inc.



Map Features:

- IADPC Boundary
- Navigation Channel

Sample ID Codes
CA = clam
CP = carp
CR = crayfish
SP = sculpin
G = surface sediment grab
E = east
W = west

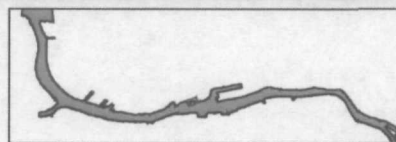
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**Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
GSP06W**



FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 150 Feet



Map Features:
IAOPC_Boundary
Navigation Channel

Sample ID Codes
CA = clam
CP = carp
CR = crayfish
SP = sculpin
G = surface sediment grab
S = sand
W = west

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**Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
GSP07E**



Legend

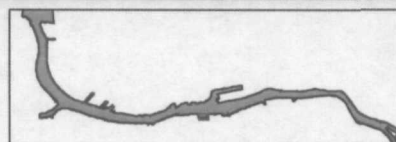
- Proposed Collocated Sediment Grab
- Shoreline as marked for sculpin/crayfish collection
- Approximate set line/crayfish pot fishing zone

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FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RL13
Channel & River miles: US Army Corps of Engineers.
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 150 Feet



Map Features:

- IADPC_Boundary
- Navigation Channel

Sediment ID Codes
CA = clam
CP = carp
CR = crayfish
SP = sculpin
G = surface sediment grab
E = east
W = west

DRAFT

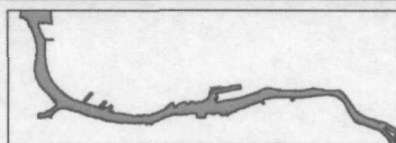
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Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
GSP07W

LWG
LOWER WILLAMETTE GROUP

0 50 100 150 Feet



Map Features:

- AOPC_Boundary
- Navigation Channel

Sample ID Codes
CA = clam
CP = carp
CR = crayfish
SP = sculpin
G = surface sediment grab
E = east
W = west

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Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
GSP08E



Legend

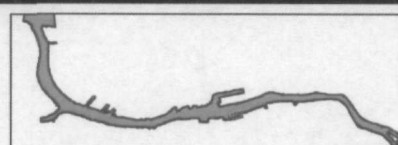
- Proposed Collocated Sediment Grab
- Shoreline as marked for sculpin/crayfish collection
- Approximate set line/crayfish pot fishing zone

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consulting inc.



FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 150 Feet



Map Features:

- IAOPC_Boundary
- Navigation Channel

Sample ID Codes
CA = clam
CP = carp
CR = crayfish
SP = sculpin
G = surface sediment grab
E = east
W = west

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Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
GCR08W

LWG
LOWER WILLAMETTE GROUP



Legend

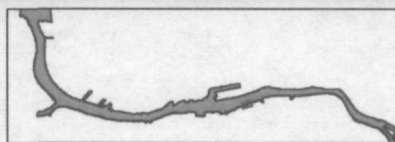
- Proposed Collocated Sediment Grab
- Shoreline as marked for sculpin/crayfish collection
- Approximate set line/crayfish pot fishing zone

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solutions inc.

LWG
LOWER WILLAMETTE GROUP

FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

0 50 100 150 Feet



Map Features:

- iAOPC_Boundary
- Navigation Channel

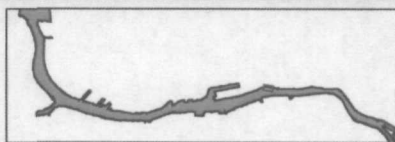
Benthic ID Codes
CA = clam
CP = carp
CR = crayfish
SP = sculpin
G = surface sediment grab
S = sand
W = weed

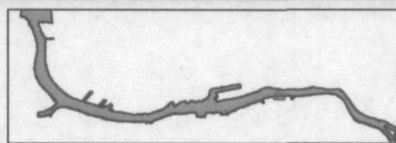
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**Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
GSP09W**

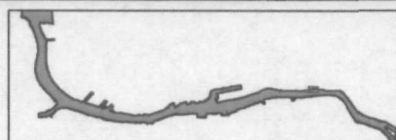






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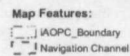
- Proposed Collocated Sediment Grab
- Shoreline as marked for sculpin/crayfish collection
- Approximate set line/crayfish pot fishing zone





LOWEN WILLAMETTE GROUP

0 50 100 150 Feet



Sample ID Codes
CA = clam
CP = carp
CR = crayfish
SP = sculpin
G = surface sediment grab
E = east
W = west

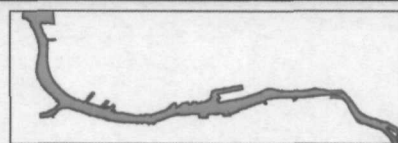
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Portland Harbor RI/FS
Proposed Sampling Locations
Biota and Collocated Sediment
GSP12E



Appendix A15

EPA. 2007. EPA email to Lower Willamette Group dated October 12, 2007 (from E. Blischke to G. Revelas) regarding Target Sculpin/Crayfish Collocated Sediment Sample Target Locations. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

Abigail Wiebe

From: Blischke.Eric@epamail.epa.gov
Sent: Friday, October 12, 2007 10:53 AM
To: Gene Revelas
Cc: humphrey.chip@epa.gov; Ian Stupakoff; Jim.McKenna@portofportland.com; goulet.joe@epa.gov; Jessica Pisano; Maja Tritt; Rick Applegate; Bob Wyatt; voster@anchorenv.com
Subject: Re: Target Sculpin/Crayfish Collocated Sediment Sample Target Locations

Gene, the locations are acceptable. Feel free to begin collection of the sediment samples next week.

Regarding the compositing scheme for crayfish and bass, we need some more time to discuss and will get back to you on Monday. In addition, there are a few things we need to discuss regarding analysis of the fish samples - such as lab duplicates, the need for any splits, the transfer of the homogenate to EPA for analysis and lab visits.

I would like to schedule a call between you and Maja and some of our technical team to discuss next week. This shouldn't be a big deal.

Eric

"Gene Revelas"
<grevelas@integral-corp.com>

10/11/2007 08:32
AM

To
Eric Blischke/R10/USEPA/US@EPA,
Chip Humphrey/R10/USEPA/US@EPA,
Joe Goulet/R10/USEPA/US@EPA
cc

"Maja Tritt"
<mtritt@integral-corp.com>, "Ian Stupakoff"
<istupakoff@integral-corp.com>,
"Bob Wyatt" <rjw@nwnatural.com>,
"Jessica Pisano"
<jpisano@anchorenv.com>,
<Jim.McKenna@portofportland.com>,
"Rick Applegate"
<ricka@bes.ci.portland.or.us>,
<voster@anchorenv.com>

Subject
Target Sculpin/Crayfish
Collocated Sediment Sample Target
Locations

Eric/Chip

I requested last week, attached find a map set and target sampling location table for the Crayfish/sculpin collocated sediment sampling. The maps show the shoreline areas (red lines) that define each sampled location. The hatched polygon areas are an approximation of the fishing zone for each area. The green

dots offshore are the target grab sample locations. Per the FSP, each sample for analysis will be a composite of a single grab from each of those three locations. The green dots are situated along a line offshore that represents the actual locations that the set lines/crayfish pots were deployed in each area. We would like to initiate this sampling program next week, so please contact me by the end of this week if you have any questions or concerns.

Note: I compressed the .pdf for emailing, let me know if you want a higher resolution version and we'll post it.

Thanks,

Gene

Gene Revelas
Managing Scientist
Integral Consulting Inc.
1205 West Bay Drive NW
Olympia, WA 98502
ph. 360.705.3534
fax 360.705.3669
cell 360.870.4950
grevelas@integral-corp.com
www.integral-corp.com

[attachment "Sculpin_Crayfish CollocSedLocs 20071011.xls" deleted by Eric Blischke/R10/USEPA/US] [attachment "R3B_CollocSeds_10112007_compressed.pdf" deleted by Eric Blischke/R10/USEPA/US]

Appendix A16

Collocated Sediment Stations for Clam Samples.

A16a. EPA. 2007. EPA email and attachments to Lower Willamette Group dated November 16, 2007 (from E. Blischke to G. Revelas) regarding collocated sediment stations for clams. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

A16b. EPA. 2007. EPA email and attachments to Lower Willamette Group dated November 18, 2007 (from J. Goulet to G. Revelas) regarding missing tow maps. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

A16c. EPA. 2007. EPA email and attachments to Lower Willamette Group dated November 19, 2007 (from J. Goulet to I. Stupakoff) regarding Missing Tow Maps. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

A16a. EPA. 2007. EPA email and attachments to Lower Willamette Group dated November 16, 2007 (from E. Blischke to G. Revelas) regarding collocated sediment stations for clams. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

From: Blischke.Eric@epamail.epa.gov [mailto:Blischke.Eric@epamail.epa.gov]
Sent: Friday, November 16, 2007 12:31 PM
To: Gene Revelas
Subject: Fw: Co-located sediment stations for clams

Gene, here are the maps generated by Joe for stations 4W, 1E and 2W.
Not sure where 5E, 11E and 12E are.

Eric

----- Forwarded by Eric Blischke/R10/USEPA/US on 11/16/2007 12:30 PM

Joe
Goulet/R10/USEPA
/US

11/16/2007 10:41
AM

To
Eric Blischke/R10/USEPA/US
cc
Chip Humphrey/R10/USEPA/US, Burt
Shephard/R10/USEPA/US
Subject
Co-located sediment stations for
clams

Eric,

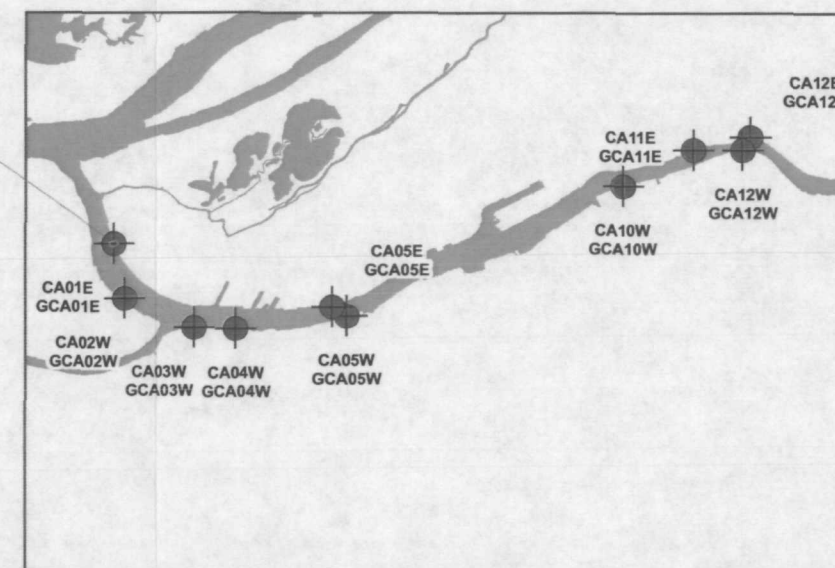
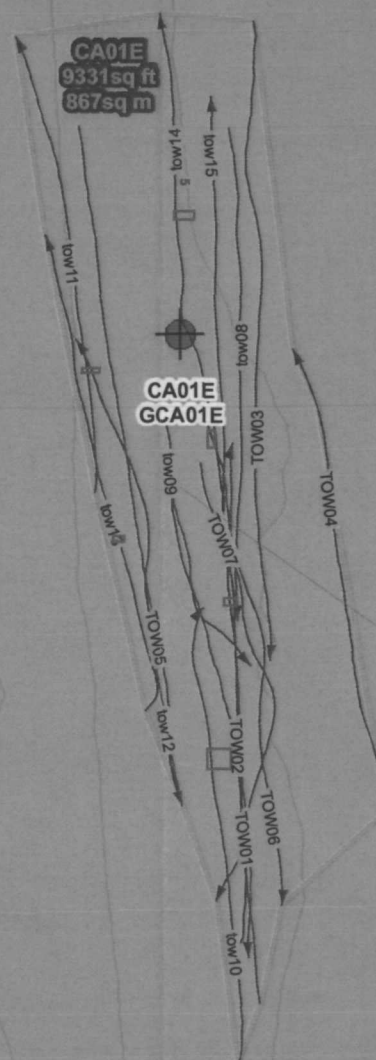
Please review and then forward these pdfs that show the sediment composite stations. I used six out of eight possible for each of these two stations. I think that is adequate.

I will wait to place sample locations at CA05W and CA03W until we see if we get more tissue. The three stations should be enough to keep them busy Monday.

(See attached file: LWG Tow Summary Station CA04W 20071114 sediment stations.pdf) (See attached file: LWG Tow Summary Station CA01E 20071114 sediment stations.pdf) (See attached file: LWG Tow Summary Station CA02W 20071114 sed stations.pdf)

Station	Tow #	Total biomass (g)	Select
LW3-CA01E	1	16.57	
LW3-CA01E	2	3.97	
LW3-CA01E	3	0.39	
LW3-CA01E	4	3.37	
LW3-CA01E	5	8.92	
LW3-CA01E	6	25.81	
LW3-CA01E	7	28.39	
LW3-CA01E	8	3.53	
LW3-CA01E	9	18.69	
LW3-CA01E	10	18.92	
LW3-CA01E	11	9.86	
LW3-CA01E	12	15.15	
LW3-CA01E	13	19.92	
LW3-CA01E	14	1.24	
LW3-CA01E	15	5.99	

Six Stations



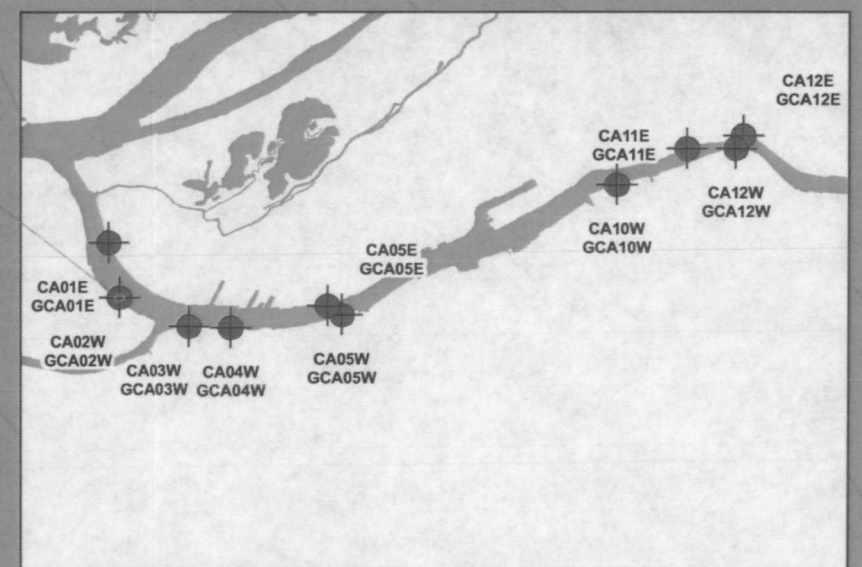
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Map X-XX
Portland Harbor RI/FS
Benthic Sledge Daily Site Results
Station: CA01E, Day: 11-14-2007

Station	Tow #	Total biomass (g)	Select
LW3-CA02W	1	0.22	
LW3-CA02W	2	3.16	
LW3-CA02W	3	0.18	
LW3-CA02W	4	0.52	
LW3-CA02W	5	1.60	
LW3-CA02W	6	33.44	
LW3-CA02W	7	0.00	
LW3-CA02W	8	15.76	
LW3-CA02W	9	9.16	
LW3-CA02W	10	2.73	
LW3-CA02W	11	2.87	
LW3-CA02W	12	6.08	
LW3-CA02W	13	3.42	
LW3-CA02W	14	4.71	
LW3-CA02W	15	0.00	
LW3-CA02W	16	8.28	

Six stations

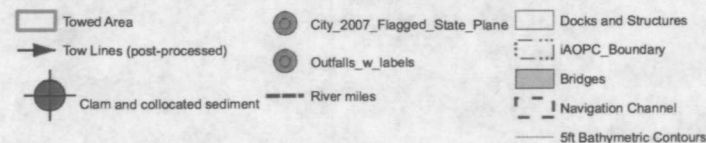


Map Document: (O:\Projects\Portland_Harbor\LWG-Map-Projects\Benthic\2007_BenthicMDXs\Station_CA04W\0071114.mxd) TWC - 11/15/2007 - 9:16:56 AM

Station	Tow #	biomass (g)	Select
LW3-CA04W	1	0.00	
LW3-CA04W	2	0.81	
LW3-CA04W	3	6.52	
LW3-CA04W	4	6.24	
LW3-CA04W	5	0.00	
LW3-CA04W	6	1.78	
LW3-CA04W	7	0.00	
LW3-CA04W	8	0.00	
LW3-CA04W	9	0.89	
LW3-CA04W	10	0.00	
LW3-CA04W	11	1.25	
LW3-CA04W	12	7.01	
LW3-CA04W	13	0.00	
LW3-CA04W	14	0.00	
LW3-CA04W	15	3.57	
LW3-CA04W	16	7.84	

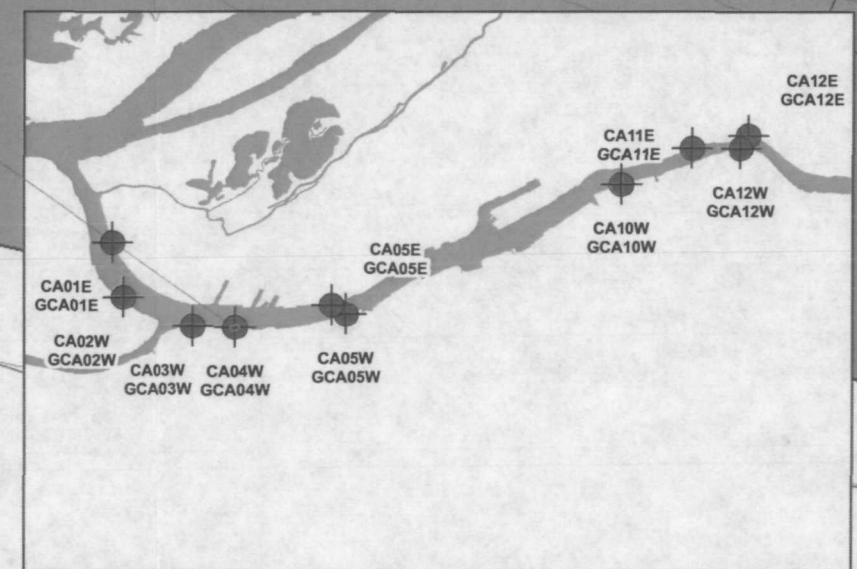


FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.



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Map X-XXa
Portland Harbor RI/FS
Benthic Sledge Daily Site Results
Station: CA04W, Day: 11-13-2007



A16b. EPA. 2007. EPA email and attachments to Lower Willamette Group dated November 18, 2007 (from J. Goulet to G. Revelas) regarding missing tow maps. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

From: Goulet.Joe@epamail.epa.gov [<mailto:Goulet.Joe@epamail.epa.gov>]
Sent: Sunday, November 18, 2007 11:27 AM
To: Gene Revelas
Cc: Blischke.Eric@epamail.epa.gov; Shephard.Burt@epamail.epa.gov
Subject: RE: Missing Tow Maps

Gene and Eric,

Here are my recommendations for composite stations for 5E, 11E and 12E.

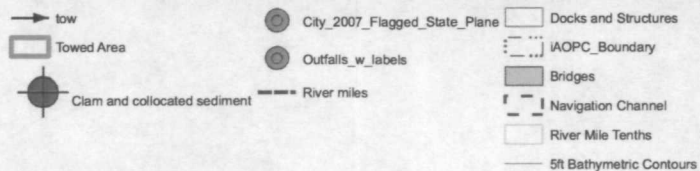
(See attached file: LWG Tow Summary Station CA12E sed stations.pdf) (See attached file: LWG Tow Summary Station CA05E sediment stations.pdf) (See attached file: LWG Tow Summary Station CA11E sed stations.pdf)

Map Document: (O:\Projects\Portland_Harbor\LWG-Map-Projects\Benthic\2007_Benthic\MDXs\Station_CA0071114.mxd) TWC -- 11/15/2007 -- 3:26:08 PM

Station	Tow #	Total biomass (g)	Select
LW3-CA05E	1	2.75	
LW3-CA05E	2	6.37	
LW3-CA05E	3	3.82	
LW3-CA05E	4	3.22	
LW3-CA05E	5	0.00	
LW3-CA05E	6	5.82	
LW3-CA05E	7	2.40	
LW3-CA05E	8	5.61	
LW3-CA05E	9	8.91	
LW3-CA05E	10	3.98	
LW3-CA05E	11	14.86	
LW3-CA05E	12	0.87	
LW3-CA05E	13	3.58	
LW3-CA05E	14	4.66	
LW3-CA05E	15	6.41	

FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

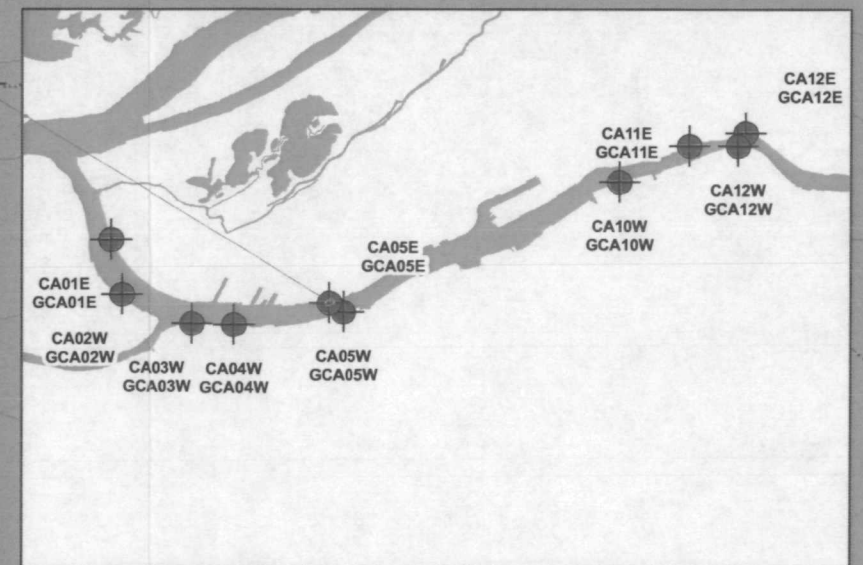
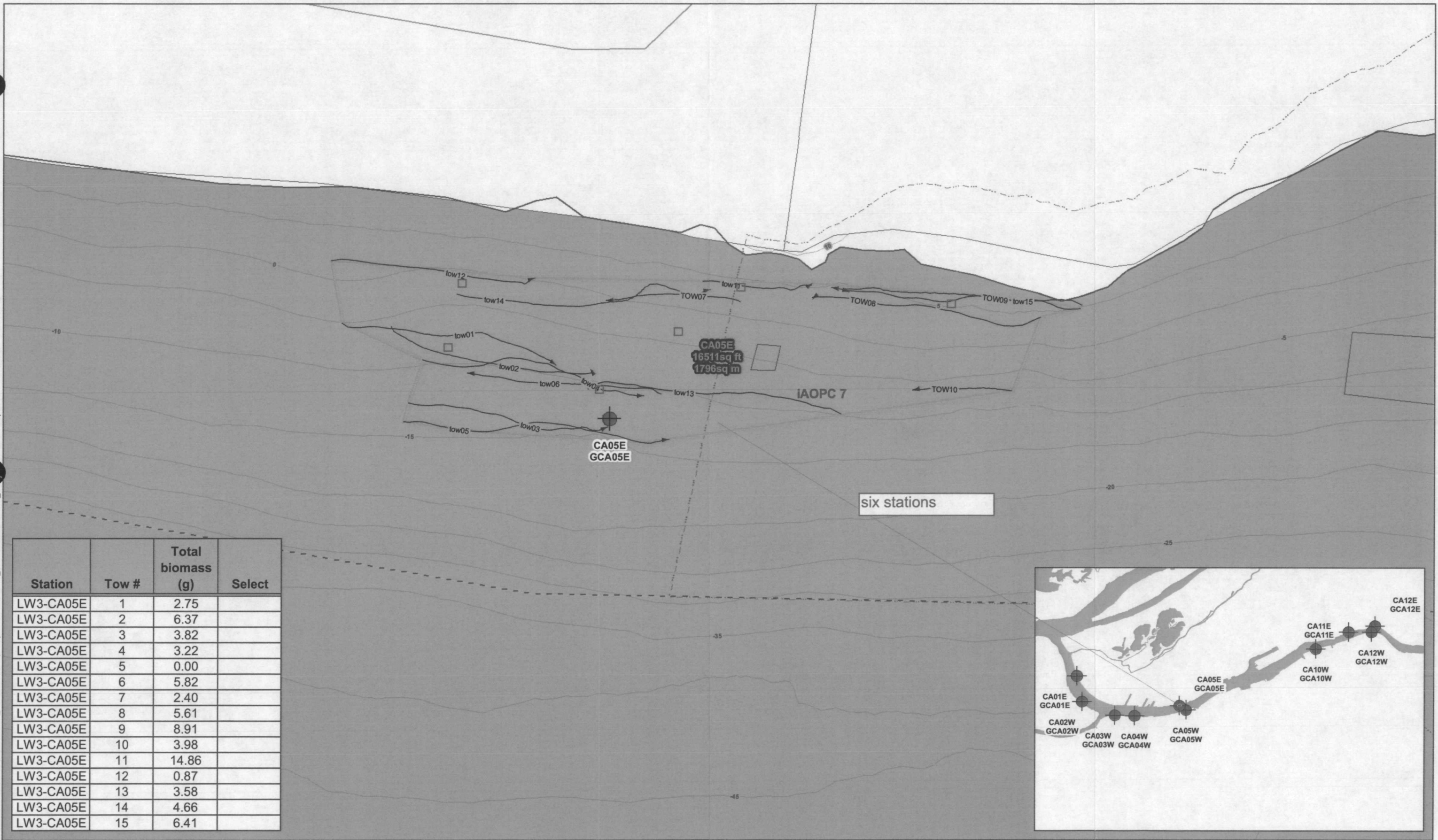
0 25 50 75 100 125 Feet



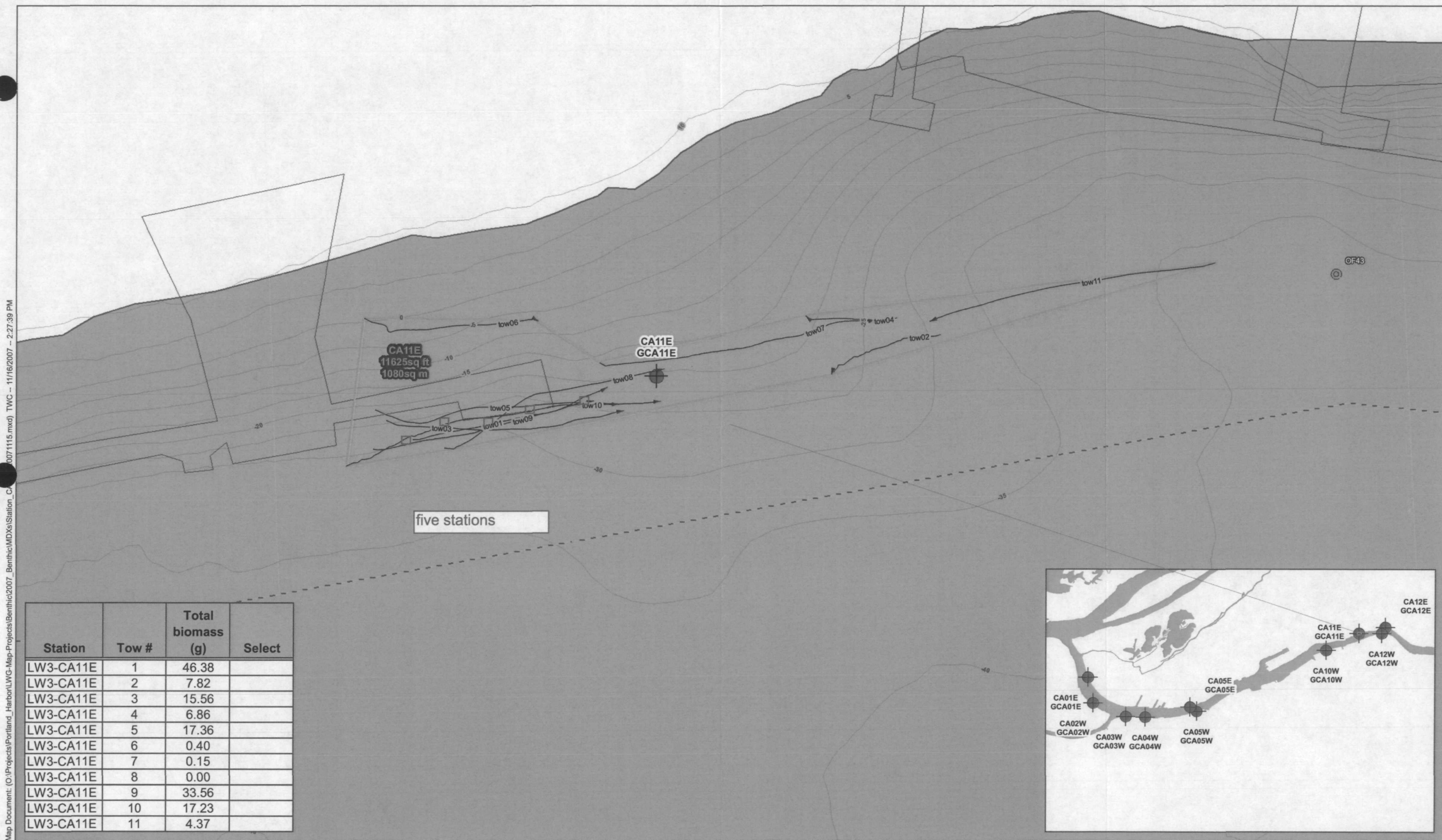
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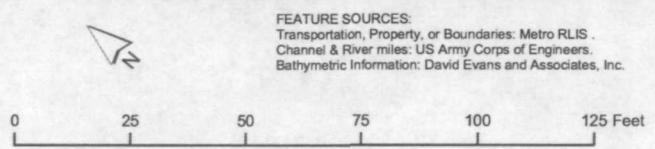
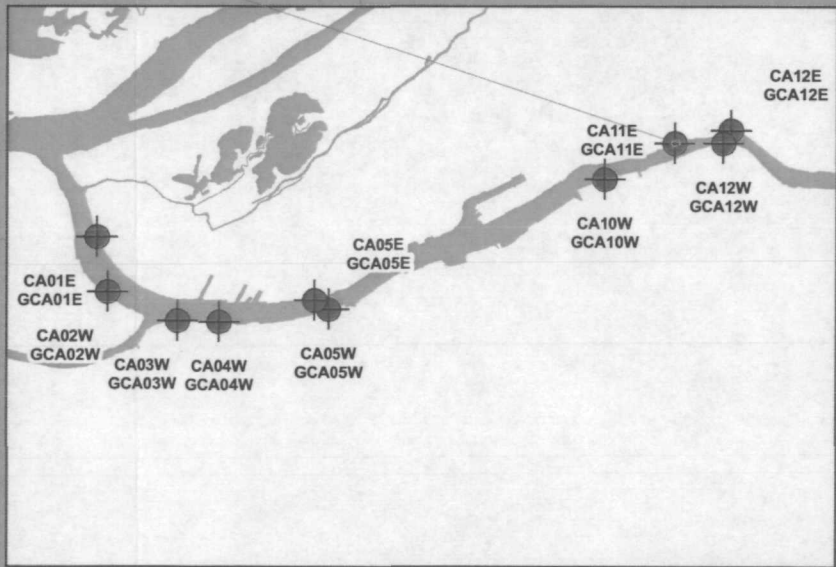
Map X-XX
Portland Harbor RI/FS
Benthic Sledge Daily Site Results
Station: CA05E, Day: 11-14/15-2007



Map Document: O:\Projects\Portland_Harbor\LWG-Map-Projects\Benthic2007_BenthicIMDXs\Station_CA11E.mxd TWC -- 11/16/2007 -- 2:27:39 PM



Station	Tow #	Total biomass (g)	Select
LW3-CA11E	1	46.38	
LW3-CA11E	2	7.82	
LW3-CA11E	3	15.56	
LW3-CA11E	4	6.86	
LW3-CA11E	5	17.36	
LW3-CA11E	6	0.40	
LW3-CA11E	7	0.15	
LW3-CA11E	8	0.00	
LW3-CA11E	9	33.56	
LW3-CA11E	10	17.23	
LW3-CA11E	11	4.37	



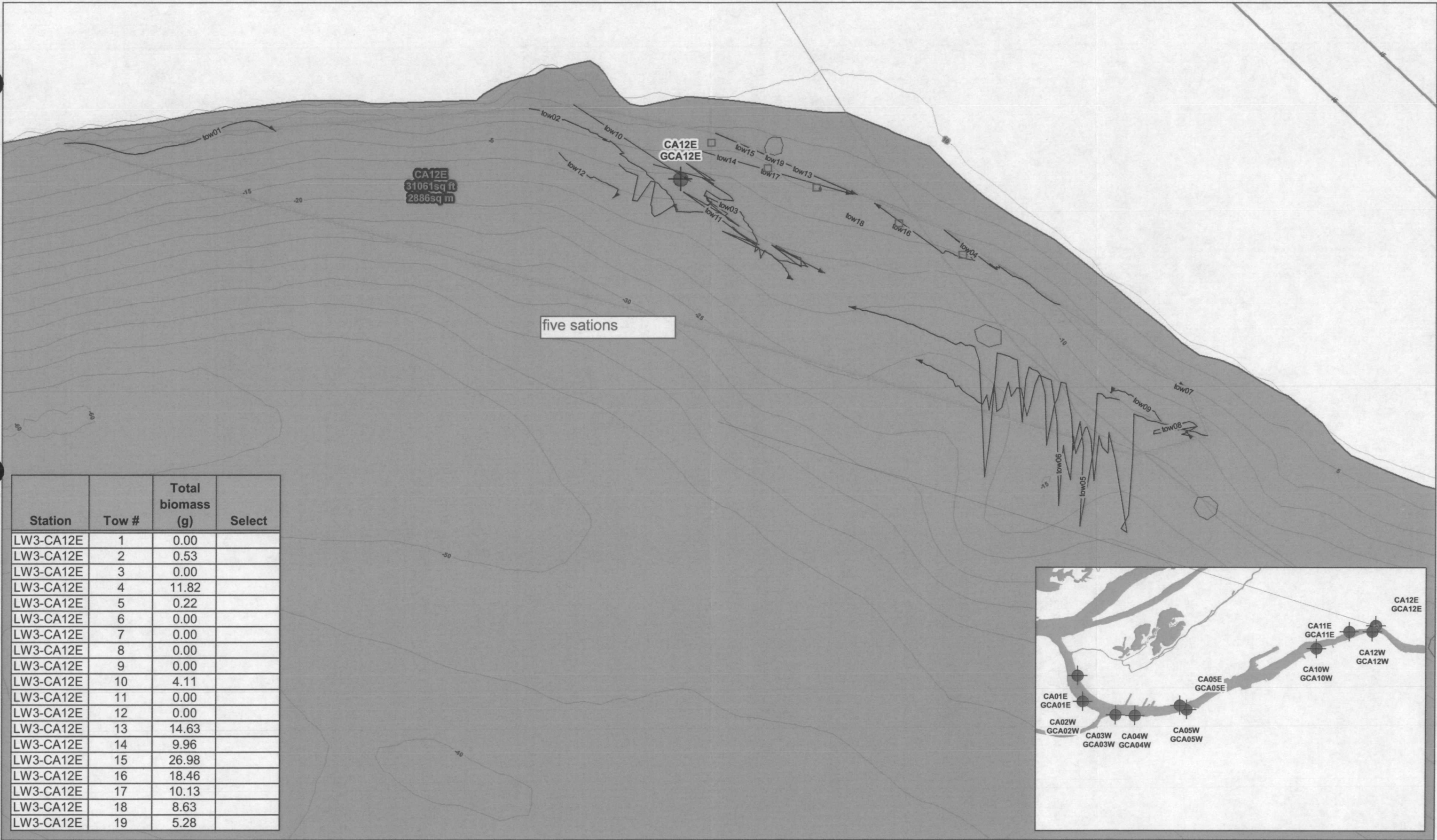
FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.
Bathymetric Information: David Evans and Associates, Inc.

- tows
- Towed Area
- City_2007_Flagged_State_Plane
- Outfalls_w_labels
- Docks and Structures
- IAOPC_Boundary
- Bridges
- Navigation Channel
- River Mile Tenths
- 5ft Bathymetric Contours
- Clam and collocated sediment
- River miles

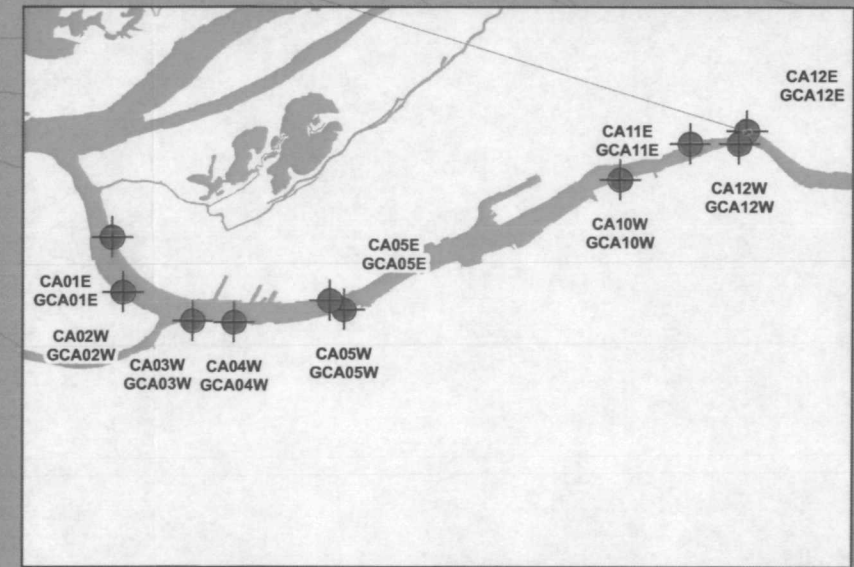
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Map X-XX
Portland Harbor RI/FS
Benthic Sledge Daily Site Results
Station: CA11E, Day: 11-15-2007

Map Document: (O:\Projects\Portland_Harbor\LWG-Map-Projects\Benthic\2007_Benthic\MDXs\Station_CA12E.mxd) TWC -- 11/16/2007 -- 2:32:43 PM



Station	Tow #	Total biomass (g)	Select
LW3-CA12E	1	0.00	
LW3-CA12E	2	0.53	
LW3-CA12E	3	0.00	
LW3-CA12E	4	11.82	
LW3-CA12E	5	0.22	
LW3-CA12E	6	0.00	
LW3-CA12E	7	0.00	
LW3-CA12E	8	0.00	
LW3-CA12E	9	0.00	
LW3-CA12E	10	4.11	
LW3-CA12E	11	0.00	
LW3-CA12E	12	0.00	
LW3-CA12E	13	14.63	
LW3-CA12E	14	9.96	
LW3-CA12E	15	26.98	
LW3-CA12E	16	18.46	
LW3-CA12E	17	10.13	
LW3-CA12E	18	8.63	
LW3-CA12E	19	5.28	



A16c. EPA. 2007. EPA email and attachments to Lower Willamette Group dated November 19, 2007 (from J. Goulet to I. Stupakoff) regarding Missing Tow Maps. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

From: Goulet.Joe@epamail.epa.gov
Sent: Monday, November 19, 2007 6:13 AM
Subject: Ian Stupakoff
Cc: David Ashton; Blischke.Eric@epamail.epa.gov; Gene Revelas; Helle B. Andersen; Jim.McKenna@portofportland.com; John Toll; Jessica Pisano; Lisa Saban; Maja Tritt; Rick Applegate; Bob Wyatt; Stefan Wodzicki; voster@anchorenv.com; Shephard.Burt@epamail.epa.gov
Attachments: RE: Missing Tow Maps
LWG Tow Summary Station CA12W sed stations.pdf; LWG Tow Summary Station CA03W sed stations.pdf; LWG Tow Summary Station CA05W sediment stations.pdf; LWG Tow Summary Station CA10W sed stations.pdf



LWG Tow SummaryLWG Tow SummaryLWG Tow SummaryLWG Tow Summary
Station CA12W ... Station CA03W ... Station CA05W ... Station CA10W ...

Ian,

Here are my recommendations for the composite sediment sample locations for 3W, 5W, 10W and 12W.

Joe

(See attached file: LWG Tow Summary Station CA12W sed stations.pdf)(See attached file: LWG Tow Summary Station CA03W sed stations.pdf)(See attached file: LWG Tow Summary Station CA05W sediment stations.pdf)(See attached file: LWG Tow Summary Station CA10W sed stations.pdf)

"Ian
Stupakoff"
<istupakoff@integral-corp.com>

11/18/2007
04:42 PM

To
Eric Blischke/R10/USEPA/US@EPA, Joe
Goulet/R10/USEPA/US@EPA

cc

"Maja Tritt"
<mtritt@integral-corp.com>, "Lisa
Saban" <lisas@windwardenv.com>,
"John Toll" <johnt@windwardenv.com>,
"Helle B. Andersen"
<hellea@windwardenv.com>, "Bob
Wyatt" <rjw@nwnatural.com>, "David
Ashton" <Ashtod@portptld.com>,
"Jessica Pisano"
<jpisano@anchorenv.com>,
<Jim.McKenna@portofportland.com>,
"Rick Applegate"
<ricka@bes.ci.portland.or.us>,
<voster@anchorenv.com>, "Gene
Revelas"
<grevelas@integral-corp.com>,
"Stefan Wodzicki"
<swodzicki@integral-corp.com>

Subject

RE: Missing Tow Maps

Hi Joe,

Here are the last maps of clam tows from last Friday's field sampling efforts at CA03W, CA05W, CA10W, and CA12W.

The total tow area for CA12W is being recalculated using two separate polygons to more accurately measure the total sampled area. However, this will not affect choosing the locations for sediment grab samples.

We will start sampling for collocated sediments on Monday.

Below is a final summary table.

Station	Date	Total biomass (g)	Tow # from biomass sheet	Total # of clams per tow	maps done
LW3-CA01E	11/14/07	180.73	15	240	Yes
LW3-CA02W	11/14/07	92.16	16	87	Yes
LW3-CA03W	11/13,14,16/07	40.07	18	28	Yes
LW3-CA04W	11/13/07	35.91	16	24	Yes
LW3-CA05E	11/14,15/07	73.28	15	53	Yes
LW3-CA05W	11/12,13,16/07	38.67	24	29	Yes
LW3-CA10W	11/16/07	87.84	16	49	Yes
LW3-CA11E	11/15/07	149.70	11	92	Yes
LW3-CA12E	11/15/07	110.16	19	78	Yes
LW3-CA12W	11/15,16/2007	31.71	29	56	Yes

Thank you

Ian

Ian Stupakoff
Senior Scientist
Integral Consulting Inc.
5 West Bay Dr.
Olympia, WA 98502
Tel. 360 - 705 - 3534
Fax 360 - 705 - 3669

www.integral-corp.com

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From: Gene Revelas

Sent: Friday, November 16, 2007 4:19 PM

To: Blischke.Eric@epamail.epa.gov

Cc: Goulet.Joe@epamail.epa.gov; Maja Tritt; Lisa Saban; John Toll; Helle B. Andersen; Ian Stupakoff; Bob Wyatt; David Ashton; Jessica Pisano; Jim McKenna (Jim.McKenna@portofportland.com); Rick Applegate; Valerie Oster (voster@anchorenv.com)

Subject: RE: Missing Tow Maps

Eric/Joe -

1) Attached are the missing maps from yesterday, please annotate and send back ASAP. We'll need to generate target coordinates for Monday late morning/afternoon. Please note that Site 12E was a problem area for GPS with VERY poor signal reception, so some recorded lines were literally all over the map. Thomas (our GIS analyst) used the endpoints and redrew some track lines when absolutely needed, but some poor quality lines are still showing.

2) Also attached is a clam tissue biomass table. Maja provides this summary:

The labs need 30 g to complete all the analyses. Loss of 5 g is assumed during homogenization and to sides of sample containers. Actual loss may be higher or lower. 50 g was selected as a target for Round 3B to allow some extra mass for reanalysis if the lab encounters difficulty with the sample. This would also provide a buffer for variations in the actual tissue mass collected compared to the mass estimated using the clam lengths. If all goes well, 35 g should be enough. The R2 (benthic tissue) actual clam weights table is shown in tab 1; the "mass needed" table (tab 2) for 3B was derived from that data.

3) My understanding is that field crew is doing well this afternoon but we'll talk on Monday with the complied biomass amounts by station in hand.

Thanks,

Gene

Gene Revelas

Managing Scientist

Integral Consulting Inc.

1205 West Bay Drive NW

Olympia, WA 98502

ph. 360.705.3534

fax 360.705.3669

cell 360.870.4950

grevelas@integral-corp.com

www.integral-corp.com

-----Original Message-----

From: Blischke.Eric@epamail.epa.gov

[mailto:Blischke.Eric@epamail.epa.gov]

Sent: Friday, November 16, 2007 1:16 PM

To: Blischke.Eric@epamail.epa.gov

Cc: Gene Revelas; Goulet.Joe@epamail.epa.gov
Subject: Re: Missing Tow Maps

Gene, I just spoke to Joe and he informed me that after finishing 10W, Helle is going to target 5W and then 3W because both are short on tissue mass. This is acceptable. However, we still would like to confirm tissue mass requirements on Monday. If it turns out that we have sufficient mass at 4W and only 12W is short, I think we will have been successful.

Eric

Eric
Blischke/R10/USE
PA/US

11/16/2007 01:10
PM

Gene Revelas

Joe Goulet/R10/USEPA/US@EPA

Missing Tow Maps

To

cc

Subject

Gene, we do not have maps for 5E, 11E and 12E.

We have maps for 2W, 1E, 5W, 3W and 4W.

Joe has provided mark-ups for 1E, 2W and 4W but held off on 3W and 5W pending the possible collection of more tissue.

If you get the missing maps (5E, 11E and 12E) to Joe, he will mark them up while driving back to Seattle.

It looks like 10W is going well (14 g in two tows). The next station to target is 5W. Assuming we can get another 10 - 15 g at 5W, the next priority would be 5 - 10 g at 4W to ensure that we have adequate tissue mass given that the mass estimate is based on clam size and there will be some loss during homogenization.

We will discuss what additional efforts on clams are necessary on Monday. We recognize that 3W and 12W are problematic stations and are lower priority based on sediment chemistry. It would also be good to confirm the tissue mass requirements.

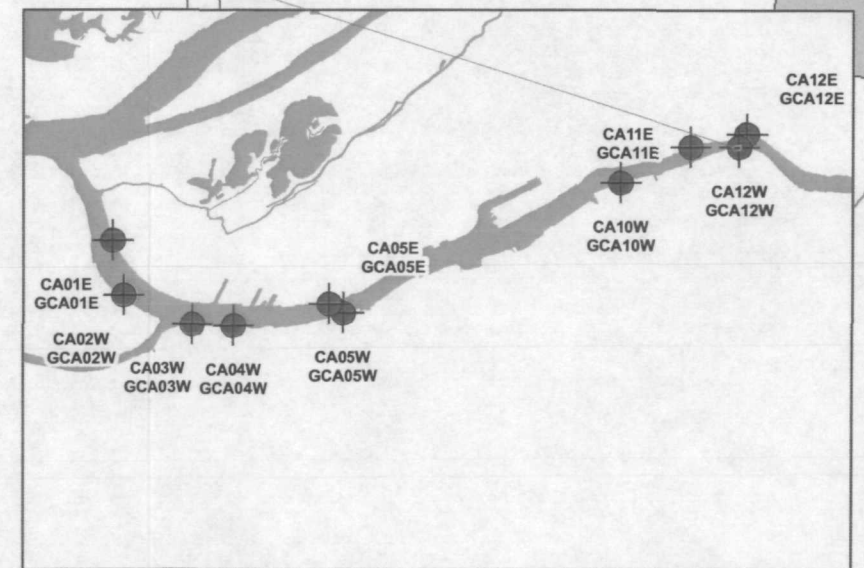
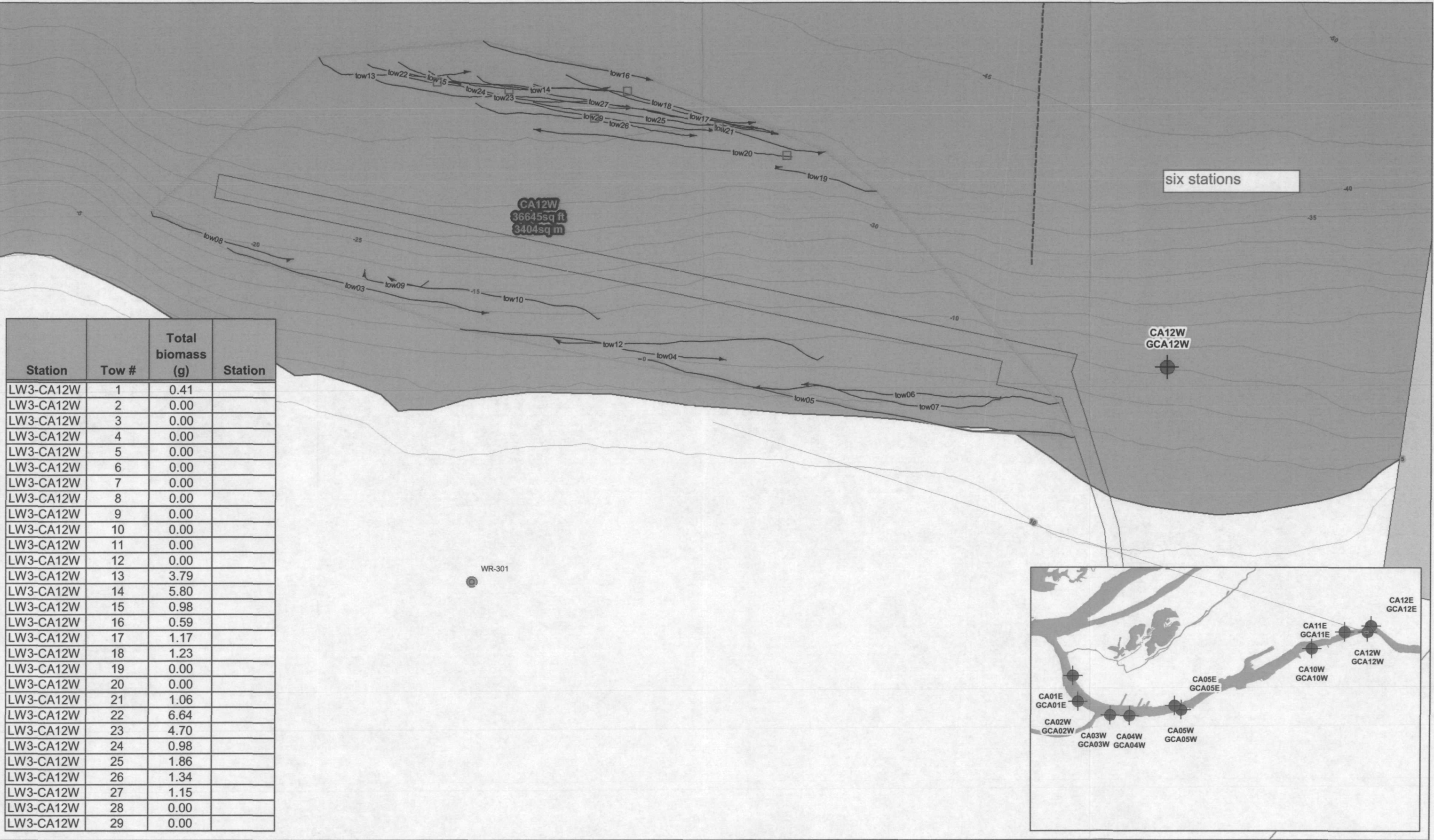
Let me know if you have any questions.

Thanks, Eric

[attachment "LWG Tow Summary Station CA03W 20071116.pdf" deleted by Joe Goulet/R10/USEPA/US] [attachment "LWG Tow Summary Station CA05W 20071116.pdf" deleted by Joe Goulet/R10/USEPA/US] [attachment "LWG Tow Summary Station CA10W 20071116.pdf" deleted by Joe Goulet/R10/USEPA/US] [attachment "LWG Tow Summary Station CA12W 20071116.pdf" deleted by Joe Goulet/R10/USEPA/US] [attachment "Copy of Tow_Data_20071116(SW).xls" deleted by Joe Goulet/R10/USEPA/US]

Map Document: (O:\Projects\Portland_Harbor\Map-Projects\Benthic\2007_Benthic\MDXs\Station_CA12W_20071116.mxd) TWC - 11/17/2007 - 3:38:30 PM

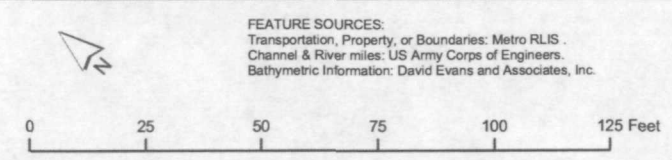
Station	Tow #	Total biomass (g)	Station
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LW3-CA12W	2	0.00	
LW3-CA12W	3	0.00	
LW3-CA12W	4	0.00	
LW3-CA12W	5	0.00	
LW3-CA12W	6	0.00	
LW3-CA12W	7	0.00	
LW3-CA12W	8	0.00	
LW3-CA12W	9	0.00	
LW3-CA12W	10	0.00	
LW3-CA12W	11	0.00	
LW3-CA12W	12	0.00	
LW3-CA12W	13	3.79	
LW3-CA12W	14	5.80	
LW3-CA12W	15	0.98	
LW3-CA12W	16	0.59	
LW3-CA12W	17	1.17	
LW3-CA12W	18	1.23	
LW3-CA12W	19	0.00	
LW3-CA12W	20	0.00	
LW3-CA12W	21	1.06	
LW3-CA12W	22	6.64	
LW3-CA12W	23	4.70	
LW3-CA12W	24	0.98	
LW3-CA12W	25	1.86	
LW3-CA12W	26	1.34	
LW3-CA12W	27	1.15	
LW3-CA12W	28	0.00	
LW3-CA12W	29	0.00	



Map Document: (O:\Projects\Portland_Harbor\LWG-Map-Projects\Benthic\2007_Benthic\MDXs\Station_CA03W1114.mxd) TWC - 11/15/2007 - 9:20:14 AM



Station	Tow #	Total biomass (g)	Station
LW3-CA03W	1	2.91	
LW3-CA03W	2	1.55	
LW3-CA03W	3	3.37	
LW3-CA03W	4	3.34	
LW3-CA03W	5	0.00	
LW3-CA03W	6	1.25	
LW3-CA03W	7	2.88	
LW3-CA03W	8	0.98	
LW3-CA03W	9	2.53	
LW3-CA03W	10	4.47	
LW3-CA03W	11	1.06	
LW3-CA03W	12	1.96	
LW3-CA03W	13	0.00	
LW3-CA03W	14	0.00	
LW3-CA03W	15	4.66	
LW3-CA03W	16	0.31	
LW3-CA03W	17	6.87	
LW3-CA03W	18	1.93	



FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

- Towed Area
- Tow Lines (post-processed)
- Clam and collocated sediment
- City_2007_Flagged_State_Plane
- Outfalls_w_labels
- River miles
- Docks and Structures
- IAOPC_Boundary
- Bridges
- Navigation Channel
- 5ft Bathymetric Contours

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





Map X-XXa
Portland Harbor RI/FS
Benthic Sledge Daily Site Results
Station: CA03W, Day: 11-13/16-2007

Map Document: C:\Projects\Portland_Harbor\LWG-Map-Projects\Benthic\2007_Benthic\MDXs\Station_Ca05W_20071114.mxd TWC -- 11/15/2007 -- 9:07:50 AM

Station	Tow #	Total biomass (g)	Station
LW3-CA05W	1	8.877193	
LW3-CA05W	2	0.81	
LW3-CA05W	3	0.00	
LW3-CA05W	4	2.87	
LW3-CA05W	5	0.00	
LW3-CA05W	6a	0.00	
LW3-CA05W	7	4.16	
LW3-CA05W	8	0.89	
LW3-CA05W	9	0.00	
LW3-CA05W	10	0.00	
LW3-CA05W	11	0.00	
LW3-CA05W	12	2.01	
LW3-CA05W	13	3.12	
LW3-CA05W	14	0.00	
LW3-CA05W	15	0.98	
LW3-CA05W	16	0.00	
LW3-CA05W	17	2.14	
LW3-CA05W	18	0.00	
LW3-CA05W	19	2.53	
LW3-CA05W	20	0.00	
LW3-CA05W	21	3.90	
LW3-CA05W	22	0.00	
LW3-CA05W	23	2.94	
LW3-CA05W	24	3.44	

FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Channel & River miles: US Army Corps of Engineers
Bathymetric Information: David Evans and Associates, Inc.

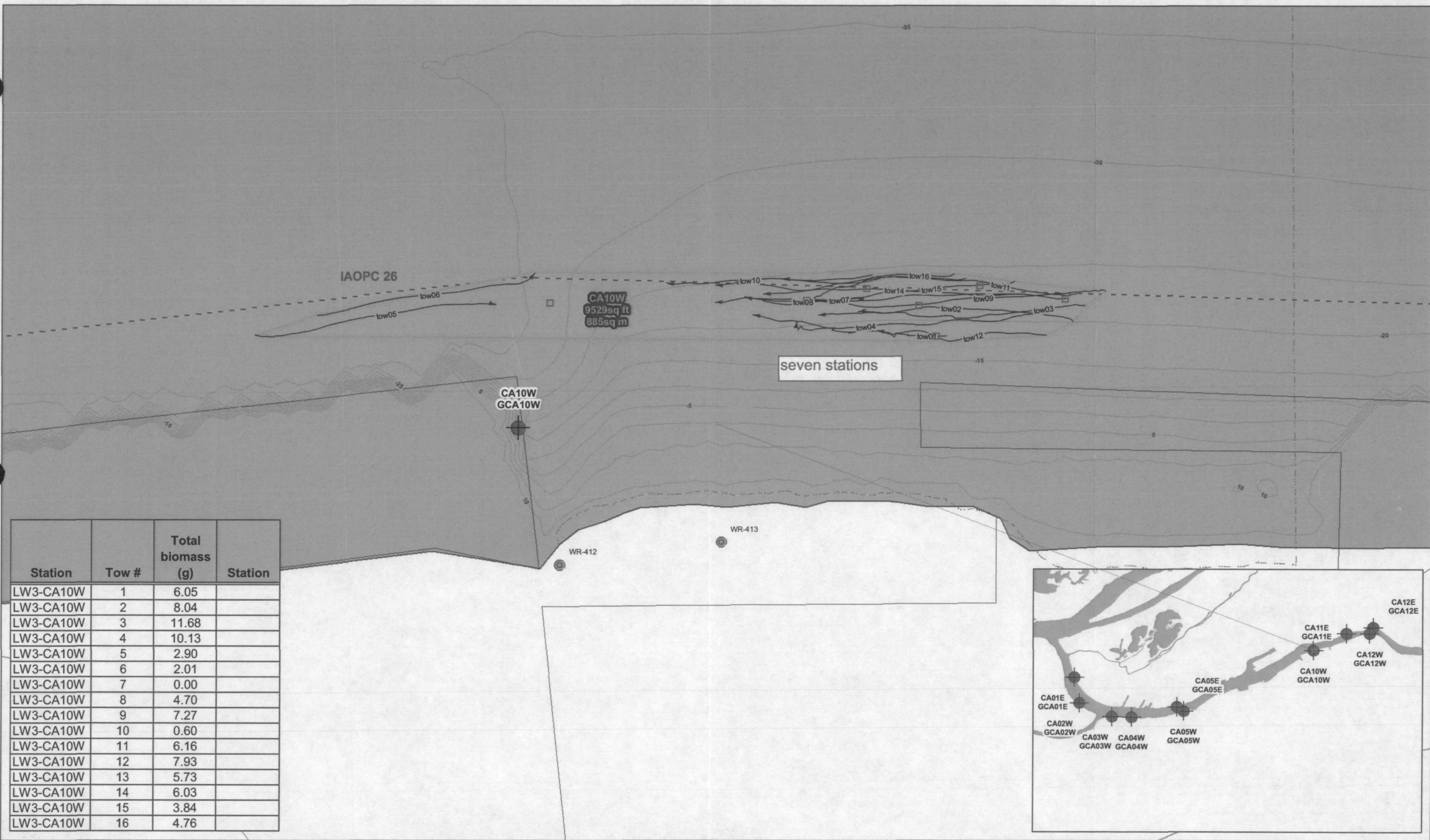
0 25 50 75 100 125 Feet

 Towed Area
 Tow Lines (post-processed)
 Clam and collocated sediment
 City_2007_Flagged_State_Plane
 Outfalls_w_labels
 Docks and Structures
 IAOPC_Boundary
 Bridges
 Navigation Channel
 5ft Bathymetric Contours
 River miles

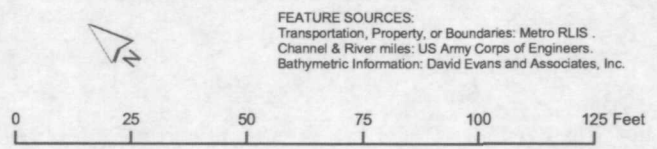
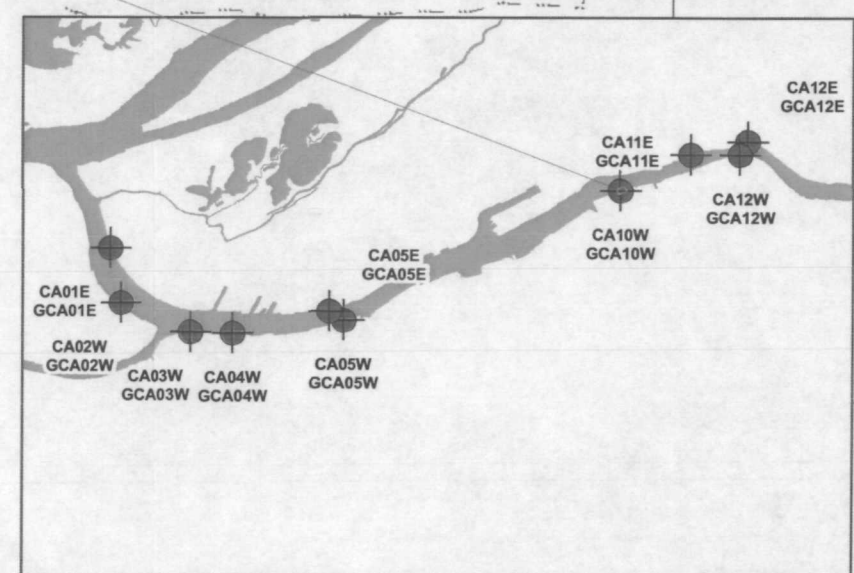
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Map X-XXa
Portland Harbor RI/FS
Benthic Sledge Daily Site Results
Station: CA05W, Day: 11-12/13/16-2007

Map Document: O:\Projects\Portland_Harbor\LWG-Map-Projects\Benthic\2007_Benthic\MDXs\Station_CA10W.mxd TWC -- 11/17/2007 -- 3:42:09 PM



Station	Tow #	Total biomass (g)	Station
LW3-CA10W	1	6.05	
LW3-CA10W	2	8.04	
LW3-CA10W	3	11.68	
LW3-CA10W	4	10.13	
LW3-CA10W	5	2.90	
LW3-CA10W	6	2.01	
LW3-CA10W	7	0.00	
LW3-CA10W	8	4.70	
LW3-CA10W	9	7.27	
LW3-CA10W	10	0.60	
LW3-CA10W	11	6.16	
LW3-CA10W	12	7.93	
LW3-CA10W	13	5.73	
LW3-CA10W	14	6.03	
LW3-CA10W	15	3.84	
LW3-CA10W	16	4.76	



FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS .
Channel & River miles: US Army Corps of Engineers.
Bathymetric Information: David Evans and Associates, Inc.

- low
- Towed Area
- Clam and collocated sediment
- City_2007_Flagged_State_Plane
- Outfalls_w_labels
- Docks and Structures
- IAOPC_Boundary
- Bridges
- Navigation Channel
- River Mile Tenths
- 5ft Bathymetric Contours
- River miles

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Work Product Prepared in Anticipation of Litigation

Map X-XX
Portland Harbor RI/FS
Benthic Sledge Daily Site Results
Station: CA10W, Day: 11-16-2007

Appendix A17

EPA. 2008. EPA email and attachment to Lower Willamette Group dated February 1, 2008 (from E. Blischke to M. Tritt) regarding Portland Harbor R3B Biota – Clam sample weights and analyses. U.S. Environmental Protection Agency, Region 10, Oregon Operations Office, Portland, OR.

-----Original Message-----

From: Blischke.Eric@epamail.epa.gov [mailto:Blischke.Eric@epamail.epa.gov]
Sent: Friday, February 01, 2008 4:24 PM
To: Maja Tritt
Cc: Christine Hawley; Claudia Powers; David Ashton; Gene Revelas; Jim McKenna; John Toll; Jessica Pisano; Laura Kennedy; Manon Tanner; Rick Applegate; Bob Wyatt; Valerie Oster
Subject: Re: Portland Harbor R3B biota | Clam sample weights and analyses

Maja, for the two depurated samples, we agree with the recommendation to perform all chemical analyses (including metals) with elevated detection limits for butyltins and PAHs as described in the attached table.

Please let me know whether you have any questions.

Thanks, Eric

"Maja Tritt"
<mttritt@integral
-corp.com>

01/17/2008 09:23
PM

To
Eric Blischke/R10/USEPA/US@EPA
cc
"Bob Wyatt" <rjw@nwnatural.com>,
"Christine Hawley"
<chawley@integral-corp.com>,
"David Ashton"
<david.ashton@portofportland.com>
, "Gene Revelas"
<grevelas@integral-corp.com>,
"Jessica Pisano"
<jpisano@anchorenv.com>, "Jim
McKenna"
<jim.mckenna@portofportland.com>,
"Rick Applegate"
<RickA@bes.ci.portland.or.us>,
"Valerie Oster"
<voster@anchorenv.com>, "Claudia
Powers" <Ckp@aterwynne.com>,
"Manon Tanner"
<mtanner@integral-corp.com>,
"John Toll"
<johnt@windwardenv.com>, "Laura
Kennedy"
<LauraKennedy@KennedyJenks.com>
Subject
Portland Harbor R3B biota | Clam
sample weights and analyses

Eric,

Ten non-depurated and five depurated clam samples were collected as part of Round 3B Biota sampling. The attached table summarizes the mass of expected and actual clam tissue collected for each sample, along with analyses to be performed for each sample. The depurated samples are identified with a "D" at the end of the sample ID. Analyses to be performed are listed on a priority basis according to the ranking established during the Round 2 effort.

The final sample mass after shucking and homogenization was greater than predicted for all of the samples. All of the undepurated clam samples contain sufficient sample mass for full analysis as indicated in the attached table. Sample mass is limited for two depurated samples, LW3-CA02W-C00D and LW3-CA10W-C00D. Full analysis may be possible for sample CA02W-C00D, but detection limits for the butyltin analysis will be elevated because only about 3g of tissue will be available for analysis rather than the required 5g. For sample CA10W-C00D, PCB congener, dioxin/furan, pesticide, lipid, metal, moisture and PAH analyses will be performed, with elevated detection limits for PAHs because only 4g of tissue will be available for analysis rather than the required 5g. SVOC and butyltin analyses will not be completed. These priorities are consistent with the Round 3B biota FSP.

We expect sample analysis to begin on approximately January 22. Please let us know if you agree with this approach prior to this date.

Sufficient sample mass appears to be available to provide subsamples of six of the undepurated clam samples to EPA, as shown in the attached table. Sufficient mass is also likely to be available to provide two depurated samples, numbers LW3-CA01E-C00D and LW3-CA11E-C00D. Please let LWG know if you are interested in these depurated samples. We will transfer subsamples to EPA upon successful completion of our laboratory analyses.

Thank you very much.

Maja Tritt

Maja Tritt
Senior Scientist
Integral Consulting Inc.
7900 SE 28th Street, Suite410
Mercer Island, WA 98040
Phone: 206-957-0353
Fax: 206-230-9601

mtritt@integral-corp.com

www.integral-corp.com

[attachment "Clam Weights Analyses.xls" deleted by Eric
Blischke/R10/USEPA/US]

Sample Mass and Analyses for Round 3B Clam Samples

Sample ID	CAS Sample ID	Number of Tows	Estimated Biomass (g)	Actual Biomass (g)	Analyses						Subsample to EPA
					Axys	CAS					
					PCB congeners, PCDD/Fs, pesticides, lipids 10 g	Metals, percent moisture 3 g	Parent and Alkylated PAHs 5 g	Mercury 2 g	SVOCs (including phthalates and phenols) 5 g	Butyltins 5 g	
LW3-CA01E-C00	K0711510-005	15	119	186.91	X	X	X	X	X	X	X
LW3-CA01E-C00D	K0711510-012	--	58	107.10	X	X	X	X	X	X	
LW3-CA02W-C00	K0711510-004	16	75	130.11	X	X	X	X	X	X	X
LW3-CA02W-C00D ^a	K0711510-011	--	17	27.91	X	X	X	X	X	X	
LW3-CA03W-C00	K0711510-003	18	40	43.59	X	X	X	X	X	X	
LW3-CA04W-C00	K0711510-002	16	36	53.02	X	X	X	X	X	X	
LW3-CA05E-C00	K0711510-006	15	73	110.87	X	X	X	X	X	X	X
LW3-CA05W-C00	K0711510-001	24	39	51.09	X	X	X	X	X	X	
LW3-CA10W-C00	K0711510-009	16	77	144.34	X	X	X	X	X	X	X
LW3-CA10W-C00D ^b	K0711510-015	--	13	17.03	X	X	X				
LW3-CA11E-C00	K0711510-007	11	76	124.68	X	X	X	X	X	X	X
LW3-CA11E-C00D	K0711510-013	--	70	151.98	X	X	X	X	X	X	
LW3-CA12E-C00	K0711510-008	19	75	107.44	X	X	X	X	X	X	X
LW3-CA12E-C00D	K0711510-014	--	36	60.42	X	X	X	X	X	X	
LW3-CA12W-C00	K0711510-010	27	31	35.59	X	X	X	X	X	X	

Notes:

^a Butyltins will have an elevated detection limit (2.91g available for analysis instead of 5g).

^b PAHs will have an elevated detection limit (4.03g available for analysis instead of 5g).



Appendix B



PORTLAND HARBOR RI/FS

**ROUND 3B FISH AND INVERTEBRATE TISSUE
AND COLLOCATED SURFACE SEDIMENT
FIELD SAMPLING REPORT**

APPENDIX B

**FIELD NOTEBOOKS AND SAMPLE
IDENTIFICATION CHANGES**

MATERIALS ON ACCOMPANYING CD

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February 15, 2008

Prepared for
The Lower Willamette Group

Prepared by
Integral Consulting Inc.
Windward Environmental LLC



Appendix C



PORTLAND HARBOR RI/FS

**ROUND 3B FISH AND INVERTEBRATE TISSUE
AND COLLOCATED SURFACE SEDIMENT
FIELD SAMPLING REPORT**

APPENDIX C

FISH TISSUE PROCESSING LOGS

MATERIALS ON ACCOMPANYING CD

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Appendix D





PORTLAND HARBOR RI/FS

**ROUND 3B FISH AND INVERTEBRATE TISSUE
AND COLLOCATED SURFACE SEDIMENT
FIELD SAMPLING REPORT**

APPENDIX D
**COLLOCATED SURFACE SEDIMENT
SAMPLE LOGS**

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February 15, 2008

Prepared for
The Lower Willamette Group

Prepared by
Integral Consulting Inc.
Windward Environmental LLC

SAMPLE LOG

11.19.07

Page: 1/3

Date: 11.19.07

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0943	02W	1	13	fine sand w/ trace fine med sand med sand some silt	Olive Grey	clam	none	
0955	02W	2	14	fine sand and silt	brown surface Olive Grey	clam shell	none	
1002	02W	3	16.5	silt w/ fine sand brown surface	brown surface grey	worm —	none	pocket sheen
1010	02W	4	13	silt w/ fine sand	brown surface olive grey	roots trace shell	none	
1020 1027	02W	5	12	silt	brown surface olive grey	roots	none	
1027	02W	6	13	silt	brown surface grey		none	
	02W	1-6	—	silt and fine sand trace medium sands	brown surface olive grey	organic materials	none	pocket sheen
1133	01E	1	12	medium sand	brown surface grey brown	none	none	
1139	01E	2	13	fine-med. sand w/ silt	brown surface	twigs, leaves	none	
1146	01E	3	13	medium sand	brown surface grey brown	none	none	

Comments:

SAMPLE LOG

11.19.07

Date: 11.19.07

Page: 2/3

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1153	01E	4	12	med-fine sand w/ silt	brown surface brown-grey	org. matter: wood, roots	none	
1200	01E	5	15	med sand	brown surface brown-grey	org matter: leaves	none	
1206	01E	6	15	med sand	brown surface brown-grey	small twigs	none	
	01E	1-4		med-fine sand w/ silt	brown grey	organic matter	none	
1352	04W	1	16	brwn coarse sand w/ silt	brown surface drk grey	small woody debris	none	sheen pockets trace petroleum odor
1400	04W	2	12	Silt w/ coarse sand	brown surface drk grey	woody debris	none	Silt clasts metal debris pocket sheen debris
1415	04W	3	14	Silt w/ trace med-sand	brown surface grey	woody debris	none	Silt clumps
1422	04W	4	13	Silt w/ trace med fine sand	brown surface drk grey		none	pocket sheen (small)
1439	04W	5	13	Silt trace med sand	brown surface drk grey	woody debris	none	pocket sheen silt clumps
1448	04W	6	16	Silt trace fine-med sand	brown surface drk grey		none	

Comments:

11.19.07

SAMPLE LOG

Date: 11.19.07

Page: 3 of 3

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1350	04W	1-6	—	Silt w/ med-fine sand	grey	organic wood, plant	none	pocket sheen
1520	05E	1	12	silt w/ Silt w/ medium sand fine	grey	large woody debris	none	lots of organic matter roots, twig, clam
1527	05E	2	13	Silt w/ med-fine sand	brown surface drk grey	lots of woody debris	none	pocket sheen clam
1533	05E	3	14	Silt w/ med-fine sand	brown surface drk grey	some org. material roots	none	
1543 1544	05E	4	14	Silt w/ med-fine sand	brown surface drk grey	lots of org. material sticks, roots	none	metal rebar in sample sticks (wood) debris
1549	05E	5	12	med sand w/ trace silt	brown surface drk grey	woody debris	none	
1620	05E	6	12 12	Silt w/ fine sand	brown surface drk grey	organic debris	normal	Woody, plant
1520	05E	1-6	—	Silt w/ fine-med sand	drk grey	organic debris	none	pocket sheens

Comments:

mile
577-1280

SAMPLE LOG

Date: 11.20.07

Page: 1 of 2


Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0936	12E	1	12	med sand w/ silt some gravel	brown surface dark grey	trace woody & shell debris	none	
1052	12E	2	12 13	fine med sand w/ silt some gravel	brown surface grey	organic matter- mgs, leaves	none	some shell debris
1108	12E	3	12	fine sand w/ silt	brown surface grey	organic matter- sticks, grass	none	some shell fragments
	12E	1-3	—	fine-med sand w/ silt	grey	sm. wood pieces shell frags	none	
1208	12W	1	15	silt w/ trace fine sand	olive-br grey	lots of small woody debris	none	shell fragment & clam
1215	12W	2	14	silt w/ fine-med sand	olive-br grey	sm. organic material sticks, grass	none	
1222	12W	3	13	silt w/ med-fine sand	olive-br grey	roots-org. material, twigs	none	
1229	12W	4	13	fine sand w/ silt fine sand and silt	olive-brown grey	org. matter shells, roots	none	
1238	12W	5	13	fine-med sand	olive-brown grey	sm. bits of organic matter	none	
1300	12W	6	14	fine-med sand w/ trace silt	olive brown grey	sm. leaves	none	

Comments:

SAMPLE LOG

Date: 11.20.07

Page: 2 of 2

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
	12W	1-6	—	fine sand-silt w/ med sand	olive br. grey	organic- leaf/twig litter	none	pocket sheen
1410	10W	1	17	silt	green grey	worm	none	pocket sheen
1430	10W	2	16	silt w/ trace med. sand	brown surface olive-grey	worm	none	pocket sheen
1435	10W	3	12	silt w/ fine sand	brown surface olive-grey	org matter twig	none	pocket sheen
1440	10W	4	13	silt w/ fine sand	brown surface grey	org. matter twigs	none	
1446	10W	5	14	silt w/ med sand	brown surface drk grey	twigs, leaf matter	none	surface sheen plastic
1450	10W	6	13	silt w/ med sand	brn surface drk grey	org. matter roots sm. sticks	none	fine pocket sheen
1459	10W	7	14	silt w/ med sand	brown surface drk grey	organic woody debris	none	garbage-metal surface pocket sheen
	10W	1-7	—	silt w/ fine-med sand.	drk grey	organic debris- woody, leaf	slight petroleum	surface sheen
								

Comments:

SAMPLE LOG

Date: 11.22.07

Page: 1022

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0915	05W	1	17	silt w/ trace fine sand	low surface olive grey	organic matter- twigs, roots worm	none	cobble (1 rock) in sample
0928	05W	2	17	silt w/ trace fine sand	brown surface olive grey	sm. org. matter- twigs, roots	none	worm,
0934	05W	3	17	silt w/ trace fine sand	brown surface dark olive grey	org. matter roots, twigs	none	wood
0947	05W	4	17	silt w/ trace fine sand	brown surface dark olive grey	org. material twigs, roots	none	
0952	05W	5	17	silt w/ trace fine sand	brown surface dark olive grey	large piece of wood trace org. debris	none	paint chip
1001	05W	6	12	silt w/ trace fine-med sand	brown surface dark olive grey	org. matter twigs, leaf dark brown silt	none	
1017	05W	7	16	silt w/ trace fine sand	brown surface dark olive grey	trace sticks	none	slight surface
	05W	1-7	-	silt w/ trace fine sand	dark olive grey	woody debris	none	pocket sheen
1057	03W	1	15	silt w/ trace fine sand	brown surface dark grey	Ø	none	pocket sheen
1102	03W	2	17	silt w/ trace fine sand	org. debris - stick, roots	brown surface dark olive grey	none	pocket sheen

Comments:

Date: 11.21.07

SAMPLE LOG

Page: 2 of 2

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1107	03W	3	17	silt w/ trace fine sand	brown surface dk olive grey	org. matter roots, twigs	none	
1112	03W	4	17	silt w/ trace fine sand	brown surface dk olive grey	org. matter roots, twigs	none	
1128	03W 03W	5	17	silt w/ trace fine sand	brown surface dk olive grey	trace roots, twigs	none	
1138	03W	6	17	silt w/ trace fine sand	brown surface dk olive grey	trace- roots	none	
	03W	1-6	—	silt w/ trace fine sand	dk olive grey	trace roots	none	

Comments:

RD 3B Colocated
Sediment - Clams

Date: 12/6/07

SAMPLE LOG J. Reeve

Page: 1 of 2

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1347	GCA11E-1	1	20	0-8 silty sand (30% silt) f-m sand, v. loose tr. gravel	brownish gray	none	none	1 small clam on surface
				8-20 sandy gravel (50% sand f-m) Gravel is med-3cm cobble, subang-subround	gray	none	none	
1426	GCA11E-2	3	16	0-5 silty sand (30%) f-m sand, tr. gravel 5-16 sand w/ gravel 20% gravel (coarse to 2cm), subang gr. f-m sand	brownish gray	—	none	wood in jaws
					gray	occ. wood chunks	none	
1441	GCA11E-3	1	24	Same as above except 5-24: (w/ increasing silt last 4cm)	—	—	—	fishing net in jaws. lt. sheen
1456	GCA11E-4	1	20	Same as above except 35% gravel below 5	brownish gray to gray	occ. wood debris below 5	none	tr. sheen
1508	GCA11E-5	1	17	Same as previous except	—	—	—	no sheen
1620	GCA12E-1	1	28	0-1 silt, soft 1-28 sand, m-c.v. loose tr. fine gravel. occ. v. large drop stones (10cm+)	l. brown	—	none	trash in jaws
					dk gray	trash	none	

Comments:

SEDIMENT

J. Reeve

Page: 2 of 2

Comments:

SAA- Same as above

Appendix E





PORTLAND HARBOR RI/FS

**ROUND 3B FISH AND INVERTEBRATE TISSUE
AND COLLOCATED SURFACE SEDIMENT
FIELD SAMPLING REPORT**

**APPENDIX E
CLAM PROCESSING LOGS**

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February 15, 2008

Prepared for
The Lower Willamette Group

Prepared by
Integral Consulting Inc.
Windward Environmental LLC

Field Clam Collection Form

Page 1 of 1

Crew: T. Do, E. Doffield

Date: 11/12/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-05W	15	0.41	Tow 1
	22	0.39	
	27	1.35	
	30	1.06	
	32	1.89	
	38	2.07	
LW3-CA-05W	21	0.81	Tow 2
LW3-CA-05W	—	—	Tow 3 abandoned, broke clavit
LW3-CA-05W	32	0.98	Tow 4 8.25
	23	1.89	8.25
LW3-CA-05W	—	—	No clams in Tow 5
moved to new form - 2 nd day of sampling.			

Field Clam Collection Form

Page 1 of 84

Crew: Emily Duffield
Sarah Fowler
Frank Tamgen

Date: 11/13/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g wwt)	Comments
LW3-CA-05W	23	0.98	Tow 4
	32	1.89	Tow 4
	-	-	Tow 5 - no clams
	-	-	Tow 6a - no clams
	32	1.89	Tow 7 - empty sledge
	35	2.26	Tow 7
	22	0.89	Tow 8
	-	-	Tow 9 - no clams
	-	-	Tow 10 - empty sledge
	-	-	Tow 11 - no clams
	19	0.67	Tow 12
	27	1.35	Tow 12
	6	0.07	Tow 13
	9	0.15	Tow 13
	10	0.18	Tow 13
	24	1.06	Tow 13
	30	1.66	Tow 13
	-	-	Tow 14 - no clams
	13	0.31	Tow 15
	19	0.67	Tow 15
	-	-	Tow 16 - no clams
	34	2.14	Tow 17
LW3-CA-04W	-	-	Tow 1 - no clams
	21	0.81	Tow 2

Field Clam Collection Form

Page 2 of 84

Crew: Emily Doffield
Sarah Fowler
Frank Tangen

Date: 11/13/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-04W	33	2.01	Tow 3
	29	1.55	Tow 3
	40	2.96	Tow 3
	29	1.55	Tow 4
	29	1.55	Tow 4
	27	1.35	Tow 4
	23	0.96	Tow 4
	21	0.81	Tow 4
	-	-	Tow 5 - no clams
	31	1.78	Tow 6
	-	-	Tow 7 - empty sledge
	-	-	Tow 8 - no clams
	22	0.89	Tow 9
	-	-	Tow 10 - no clams
	26	1.25	Tow 11
	44	3.58	Tow 12
	29	1.55	Tow 12
	27	1.35	Tow 12
	17	0.53	Tow 12
	-	-	Tow 13 - no clams
	-	-	Tow 14 - no clams
	29	1.55	Tow 15
	33	2.01	Tow 15
↓	32	1.89	Tow 16

Field Clam Collection Form

Page 3 of 4

Crew:

Date: 11/13/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-04W			
LW3-CA-04W	32	1.89	Tow 10
	31	1.78	Tow 10
	25	1.15	Tow 10
	21	0.81	Tow 10
	13	0.31	Tow 10
LW3-CA-03W	36	2.40	Tow 1
	14	0.36	Tow 1
	9	0.15	Tow 1
	29	1.55	Tow 2
	41	3.11	Tow 3
	12	0.27	Tow 3
	32	1.89	Tow 34
	28	1.45	Tow 4
	—	—	Tow 5 - no clams
	26	1.25	Tow 6
	7	0.09	Tow 7
	27	1.35	Tow 7
	28	1.45	Tow 7
	23	0.98	Tow 8
	37	2.53	Tow 9
	39 m	2.81	Tow 10 - no clams
	30	1.66	Tow 10
	24	1.06	Tow 11

Field Clam Collection Form

Page 39 of 44

Crew: Emily Duffield
Sarah Fowler
Frankie

Date: 11/13/07

[illegible]

Field Clam Collection Form

Page 1 of 13

Crew: Emily Duffield
Sarah Fowler
Frank Tungen (boat driver)

Date: 11/14/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-03W	-	-	Tow 13 - no clams
↓	-	-	Tow 14 - no clams
	41	3.11	Tow 15
	29	1.55	Tow 15
LW3-CA-02W	7	0.09	Tow 1
	6	0.07	Tow 1
	6	0.07	Tow 1
	22	0.89	Tow 2
	35	2.26	Tow 2
	6	0.07	Tow 3
	8	0.12	Tow 3
	11	0.22	Tow 4
	8	0.12	Tow 4
	8	0.12	Tow 4
	6	0.07	Tow 4
	29	1.55	Tow 5
	5	0.05	Tow 5
	35	2.26	Tow 6
	37	2.53	Tow 6
	34	2.14	Tow 6
	27	1.35	Tow 6
	42	3.26	Tow 6
	39	2.81	Tow 6
↓	40	2.96	Tow 6

Field Clam Collection Form

Page 2 of 13

Crew: Emily Duffield
Sarah Fowler
Frank Tengen (boat driver)

Date: 11/14/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g wwt)	Comments
LW3-CA-02W	36	2.40	Tow 6
	49	4.44	Tow 6
	44	3.58	Tow 6
	34	2.14	Tow 6
	34	2.14	Tow 6
	28	1.45	Tow 6
	-	-	Tow 7 - no clams
	6	0.07	Tow 8
	36 31	1.78	Tow 8
	37 33	2.01	Tow 8
	38 37	2.53	Tow 8
	39 29	1.55	Tow 8
	40 46	3.91	Tow 8
	46	3.91	Tow 8
	29	1.55	Tow 9
	27	1.35	Tow 9
	25	1.15	Tow 9
	28	1.45	Tow 9
	29	1.55	Tow 9
	27	1.35	Tow 9
	9	0.15	Tow 9
	6	0.07	Tow 9
	5	0.05	Tow 9
	5	0.05	Tow 9

Field Clam Collection Form

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Crew: Emily Duffield
Sarah Fowler
Frank Tungen

Date: 11/14/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
<u>LW3-CA-02W</u>	<u>5</u>	<u>0.05</u>	<u>Tow 9</u>
	<u>7</u>	<u>0.09</u>	<u>Tow 9</u>
	<u>7</u>	<u>0.09</u>	<u>Tow 9</u>
	<u>8</u>	<u>0.12</u>	<u>Tow 9</u>
	<u>5</u>	<u>0.05</u>	<u>Tow 9</u>
	<u>6</u>	<u>0.07</u>	<u>Tow 9</u>
	<u>21</u>	<u>0.81</u>	<u>Tow 10</u>
	<u>19</u>	<u>0.67</u>	<u>Tow 10</u>
	<u>10</u>	<u>0.18</u>	<u>Tow 10</u>
	<u>10</u>	<u>0.18</u>	<u>Tow 10</u>
	<u>9</u>	<u>0.15</u>	<u>Tow 10</u>
	<u>9</u>	<u>0.15</u>	<u>Tow 10</u>
	<u>9</u>	<u>0.15</u>	<u>Tow 10</u>
	<u>8</u>	<u>0.12</u>	<u>Tow 10</u>
	<u>8</u>	<u>0.12</u>	<u>Tow 10</u>
	<u>7</u>	<u>0.09</u>	<u>Tow 10</u>
	<u>6</u>	<u>0.07</u>	<u>Tow 10</u>
	<u>5</u>	<u>0.05</u>	<u>Tow 10</u>
	<u>37</u>	<u>2.53</u>	<u>Tow 11</u>
	<u>8</u>	<u>0.12</u>	<u>Tow 11</u>
	<u>7</u>	<u>0.09</u>	<u>Tow 11</u>
	<u>6</u>	<u>0.07</u>	<u>Tow 11</u>
	<u>6</u>	<u>0.07</u>	<u>Tow 11</u>
	<u>384</u>	<u>2.14</u>	<u>Tow 12</u>

Field Clam Collection Form

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Crew: G. Duffield
S. Fowler
F. Tanager (boat driver)

Date: 11/14/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-02W	34	2.14	Tow 12
	25	1.15	Tow 12
	7	0.09	Tow 12
	6	0.07	Tow 12
	8	0.12	Tow 12
	7	0.09	Tow 12
	5	0.05	Tow 12
	6	0.07	Tow 12
	7	0.09	Tow 12
	5	0.05	Tow 12
	5	0.05	Tow 12
	43	3.42	Tow 13
	40	2.96	Tow 14
	29	1.55	Tow 14
	7	0.09	Tow 14
	6	0.07	Tow 14
	5	0.05	Tow 14
	44	3.58	Tow 15 16
	31	2.81	Tow 15 16
	32	1.89	Tow 15 16
	-	-	Tow 15 - empty sledge

Field Clam Collection Form

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Crew:

Date: 11/14/07

Composited by H. Andersen +
E. Duffield

Composite Sample - 12:05

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-02W-000	43	3.42	Total mass for composite
	47	4.09	at LW3-CA-02W =
	48	4.26	74.26
	37	2.53	73.03 74.65
	36	2.40	
	39	2.81	Total # of clams in composite =
	44	3.58	69 69 clams
	38	2.67	
	41	3.11	
	33	2.01	
	32	1.89	
	36	2.40	
	34	2.14	
	34	2.14	
	33	2.01	
	27	1.35	
	30	1.66	
	32	1.89	
	27	1.35	
	26	1.25	
	26	1.25	
	27	1.35	
	29	1.55	
	29	1.55	

27	1.35	length	est weight
19	0.67	42	3.26
21	0.81	28	1.45
39	2.81	37	2.53
37	2.53	17 b/c 5+6 mm	17 x .55
28	1.45	16 b/c 7+8 mm	16 x .75
		3 c 1 cm	3 x 1.0

Field Clam Collection Form

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Crew: Compositied by
H. Andersen +
E. Duffield

Date: 11/14/07

Dehydrated Sample - 12:10

[illegible]

Field Clam Collection Form

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Crew: E. Duffield
S. Fowler
F. Tangen

Date: 11/14/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-01 E	30	1.66	Tow 1
	29	1.55	Tow 1
	31	1.78	Tow 1
	38	2.67	Tow 1
	29	1.55	Tow 1
	26	1.25	Tow 1
	28	1.45	Tow 1
	28	1.45	Tow 1
	31	1.78	Tow 1
	9	0.15	Tow 1
	8	0.12	Tow 1
	9	0.15	Tow 1
	9	0.15	Tow 1
	9	0.15	Tow 1
	8	0.12	Tow 1
	8	0.12	Tow 1
	7	0.09	Tow 1
	8	0.12	Tow 1
	9	0.15	Tow 1
	7	0.09	Tow 1
	6	0.07	Tow 1
	33	2.01	Tow 2
	11	0.22	Tow 2
✓	11	0.22	Tow 2

Field Clam Collection Form

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Crew: E. Duffield
S. Fowler
F. Tanager

Date: 11/14/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
<u>W3-CA-01E</u>	<u>11</u>	<u>0.22</u>	<u>Tow 2</u>
	<u>13</u>	<u>0.31</u>	<u>Tow 2</u>
	<u>8</u>	<u>0.12</u>	<u>Tow 2</u>
	<u>10</u>	<u>0.18</u>	<u>Tow 2</u>
	<u>9</u>	<u>0.15</u>	<u>Tow 2</u>
	<u>7</u>	<u>0.09</u>	<u>Tow 2</u>
	<u>8</u>	<u>0.12</u>	<u>Tow 2</u>
	<u>7</u>	<u>0.09</u>	<u>Tow 2</u>
	<u>7</u>	<u>0.09</u>	<u>Tow 2</u>
	<u>7</u>	<u>0.09</u>	<u>Tow 2</u>
	<u>5</u>	<u>0.05</u>	<u>Tow 2</u>
	<u>9</u>	<u>0.15</u>	<u>Tow 3</u>
	<u>6</u>	<u>0.07</u>	<u>Tow 3</u>
	<u>6</u>	<u>0.07</u>	<u>Tow 3</u>
	<u>6</u>	<u>0.07</u>	<u>Tow 3</u>
	<u>5</u>	<u>0.05</u>	<u>Tow 3</u>
	<u>36</u>	<u>2.40</u>	<u>Tow 4</u>
	<u>9</u>	<u>0.15</u>	<u>Tow 4</u>
	<u>10</u>	<u>0.18</u>	<u>Tow 4</u>
	<u>9</u>	<u>0.15</u>	<u>Tow 4</u>
	<u>10</u>	<u>0.18</u>	<u>Tow 4</u>
	<u>6</u>	<u>0.7</u>	<u>Tow 4</u>
	<u>6</u>	<u>0.7</u>	<u>Tow 4</u>
	<u>6</u>	<u>0.7</u>	<u>Tow 4</u>

Field Clam Collection Form

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Crew:

Date: 11/14/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-01E	6	0.7	Tow 4
	5	0.05	Tow 4
	32	1.89	Tow 5
	45	3.74	Tow 5
	37	2.53	Tow 5
	9	0.15	Tow 5
	9	0.15	Tow 5
	8	0.12	Tow 5
	7	0.09	Tow 5
	7	0.09	Tow 5
	7	0.09	Tow 5
	6	0.07	Tow 5
	44	3.58	Tow 6
	38	2.67	Tow 6
	35	2.26	Tow 6
	34	2.14	Tow 6
	32	1.89	Tow 6
	37	2.53	Tow 6
	27	1.35	Tow 6
	32	1.89	Tow 6
	31	1.78	Tow 6
	30	1.66	Tow 6
	19	0.67	Tow 6
	11	0.22	Tow 6

Field Clam Collection Form

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Crew: E Duffield
S. Fowler
F. Tangen (boat driver)

Date: 11/14/17

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-01E	11	0.22	Tow 6
	11	0.22	Tow 6
	10	0.18	Tow 6
	10	0.18	Tow 6
	8	0.12	Tow 6
	9	0.15	Tow 6
	10	0.18	Tow 6
	10	0.18	Tow 6
	10	0.18	Tow 6
	7	0.09	Tow 6
	8	0.12	Tow 6
	3 @ 3 mm	3 @ 0.12	Tow 6
	5 @ 7 mm	5 @ 0.09	Tow 6
	6 @ 6 mm	6 @ 0.07	Tow 6
	3 @ 5 mm	3 @ 0.05	Tow 6
	33	2.01	Tow 7
	29	1.55	Tow 7
	33	2.01	Tow 7
	34	2.14	Tow 7
	34	2.14	Tow 7
	34	2.14	Tow 7
	30	1.66	Tow 7
	33	2.01	Tow 7
	40	2.96	Tow 7

Field Clam Collection Form

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Crew: E. Duffield
S. Fowler
F. Tonger

Date: 4/14/07

Sample ID	Length of <i>Corbicula</i> -sp. (mm)	Estimated Biomass (g wwt)	Comments
W3-CA-01E	31	1.78	Tow 7
	29	1.55	Tow 7
	27	1.35	Tow 7
	38	2.67	Tow 7
	21	0.81	Tow 7
	50 9 mm	50 0.15	Tow 7
	40 8 mm	40 0.12	Tow 7
	30 7 mm	30 0.09	Tow 7
	20 6 mm	20 0.07	Tow 7
	35	2.26	Tow 8
	13	0.31	Tow 8
	40 9 mm	40 0.15	Tow 8
	40 7 mm	40 0.09	Tow 8
	42	3.26	Tow 9
	33	2.01	Tow 9
	33	2.01	Tow 9
	37	2.53	Tow 9
	35	2.26	Tow 9
	34	2.14	Tow 9
	32	1.89	Tow 9
	26	1.25	Tow 9
	10	0.18	Tow 9
	20 9 mm	20 0.12	Tow 9
	50 7 mm	50 0.09	Tow 9

40 6 mm 40 0.07 Tow 9
30 5 mm 30 0.05 Tow 9
27 1.35 Tow 10
41 3.11 Tow 10
35 2.26 Tow 10
33 2.01 Tow 10

Field Clam Collection Form

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Crew: E. Duffield
S. Fowler
F. Tanager (boat driver)

Date: 11/14/07

Sample ID	Length of <i>Corbicula</i> -sp. (mm)	Estimated Biomass (g ww)	Comments
W3-CA-01E	26	1.25	Tow 10
	30	1.66	Tow 10
	30	1.66	Tow 10
	32	1.89	Tow 10
	28	1.45	Tow 10
	21	0.81	Tow 10
	11	0.22	Tow 10
	10	0.18	Tow 10
	9	0.15	Tow 10
	3 c 8 mm	3 c 0.12	Tow 10
	4 c 7 mm	4 c 0.09	Tow 10
	3 c 6 mm	3 c 0.07	Tow 10
	28	1.45	Tow 11
	32	1.89	Tow 11
	42	3.26	Tow 11
	26	1.25	Tow 11
	33	2.01	Tow 11
	40	2.96	KE Tow 12
	33	2.01	Tow 12
	33	2.01	Tow 12
	25	1.15	Tow 12
	36	2.46	Tow 12
	30	1.66	Tow 12
	35	2.26	Tow 12

3 c 8 mm 3 c 0.12 Tow 12
 3 c 7 mm 3 c 0.09 Tow 12
 1 c 6 mm 0.07 Tow 12
 413 3.42 Tow 13
 38 2.67 Tow 13
 37 2.53 Tow 13

Field Clam Collection Form

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Crew: E. Duffield
S. Fowler
F. Tangen

Date: 11/14/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-05E	31	1.78	Tow 1
	23	0.98	Tow 1
	37	2.53	Tow 2
	36	3.6	Tow 2
	28	2.8	Tow 2
	38	2.67	Tow 3
	25	1.15	Tow 3
	28	1.45	Tow 4 - mussel (green)
	31	1.78	Tow 4
	-	-	Tow 5 - no clams
	31	1.78	Tow 6
	29	1.55	Tow 6
	26	1.25	Tow 6
	26	1.25	Tow 6
	34	2.14	Tow 7
	12	0.27	Tow 7
	33	2.01	Tow 8
	31	1.78	Tow 8
	26	1.25	Tow 8
	13	0.31	Tow 8
	12	0.27	Tow 8
	35	2.26	Tow 9
	35	2.26	Tow 9
	33	2.01	Tow 9
	31	1.78	Tow 9
	18	0.60	Tow 10
	28	1.45	Tow 10
	37	2.53	Tow 10

end of sampling 11/14/07

Field Clam Collection Form

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Crew: E. Dohfield
S. Fowler
F. Tungen (driver)

Date: 11/15/07

Sample ID	Length of Corbicula sp. (mm)	Estimated Biomass (g wwt)	Comments
<u>LW3-CA-11E</u>	<u>41</u>	<u>3.11</u>	<u>Tow 1</u>
	<u>38</u>	<u>2.67</u>	
	<u>32</u>	<u>1.89</u>	
	<u>25</u>	<u>1.15</u>	
	<u>31</u>	<u>1.78</u>	
	<u>29</u>	<u>1.55</u>	
	<u>30</u>	<u>1.66</u>	
	<u>34</u>	<u>2.14</u>	
	<u>31</u>	<u>1.78</u>	
	<u>16</u>	<u>0.47</u>	
	<u>30</u>	<u>1.66</u>	
	<u>25</u>	<u>1.15</u>	
	<u>27</u>	<u>1.35</u>	
	<u>31</u>	<u>1.78</u>	
	<u>36</u>	<u>2.40</u>	
	<u>28</u>	<u>1.45</u>	
	<u>25</u>	<u>1.15</u>	
	<u>29</u>	<u>1.55</u>	
	<u>29</u>	<u>1.55</u>	
	<u>35</u>	<u>2.26</u>	
	<u>25</u>	<u>1.15</u>	
	<u>32</u>	<u>1.89</u>	
	<u>27</u>	<u>1.35</u>	
↓	<u>30</u>	<u>1.66</u>	↓

Field Clam Collection Form

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Crew: E. Duffield
S. Fowler
F. Tangen (boat driver)

Date: 11/15/07

Sample ID	Length of Corbicula sp. (mm)	Estimated Biomass (g wwt)	Comments
<u>LW3-CA-11E</u>	<u>31</u>	<u>1.78</u>	<u>Tow1</u>
	<u>29</u>	<u>1.55</u>	<u>Tow 1</u>
	<u>27</u>	<u>1.35</u>	<u>Tow1</u>
	<u>25</u>	<u>1.15</u>	<u>Tow1</u>
	<u>29</u>	<u>1.55</u>	<u>Tow2</u>
	<u>31</u>	<u>1.78</u>	<u>Tow2</u>
	<u>32</u>	<u>1.89</u>	<u>Tow2</u>
	<u>28</u>	<u>1.45</u>	<u>Tow 2</u>
	<u>25</u>	<u>1.15</u>	<u>Tow2</u>
	<u>33</u>	<u>2.01</u>	<u>Tow 3</u>
	<u>28</u>	<u>1.45</u>	<u>Tow3</u>
	<u>30</u>	<u>1.69</u>	<u>Tow3</u>
	<u>32</u>	<u>1.89</u>	<u>Tow3</u>
	<u>31</u>	<u>1.78</u>	<u>Tow3</u>
	<u>29</u>	<u>1.55</u>	<u>Tow3</u>
	<u>29</u>	<u>1.55</u>	<u>Tow3</u>
	<u>32</u>	<u>1.89</u>	<u>Tow3</u>
	<u>31</u>	<u>1.78</u>	<u>Tow3</u>
	<u>28</u>	<u>1.45</u>	<u>Tow4</u>
	<u>20</u>	<u>0.74</u>	<u>Tow 4</u>
	<u>27</u>	<u>1.35</u>	<u>Tow4</u>
	<u>28</u>	<u>1.45</u>	<u>Tow4</u>
	<u>27</u>	<u>1.35</u>	<u>Tow 4</u>
<u>✓</u>	<u>17</u>	<u>0.53</u>	<u>Tow 4</u>

Field Clam Collection Form

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Crew: E. Duffield
S. Fowler
F. Tungen

Date: 11/15/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-011E	25	1.15	Tow 5
	27	1.35	Tow 5
	30	1.66	Tow 5
	33	2.01	Tow 5
	36	2.40	Tow 5
	33	2.01	Tow 5
	30	1.66	Tow 5
	26	1.25	Tow 5
	28	1.45	Tow 5
	23	0.98	Tow 5
	28	1.45	Tow 5
	13	0.31	Tow 6
	7	0.29	Tow 6
	9	0.15	Tow 7
	-	-	Tow 8 - empty sledge - bad tow
	33	2.01	Tow 9
	30	1.66	Tow 9
	31	1.78	Tow 9
	35	2.26	Tow 9
	32	1.89	Tow 9
	36	2.40	Tow 9
	35	2.26	Tow 9
	36	2.40	Tow 9
	36	2.40	Tow 9

Field Clam Collection Form

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Crew: E. Duffield
S. Fowler
F. Tonger

Date: 11/15/07

Sample ID	Length of Corbicula sp. (mm)	Estimated Biomass (g ww)	Comments
CW3-CA-11E	37	2.53	Tow 9
	27	1.35	Tow 9
	29	1.55	Tow 9
	30	2.40	Tow 9
	27	1.35	Tow 9
	33	2.01	Tow 9
	30	1.66	Tow 9
	30	1.66	Tow 9
	33	2.01	Tow 10
	26	1.25	Tow 10
	30	2.40	Tow 10
	35	2.26	Tow 10
	25	1.15	Tow 10
	33	2.01	Tow 10
	25	1.15	Tow 10
	30	1.66	Tow 10
	29	1.55	Tow 10
	31	1.78	Tow 10
	21	0.81	Tow 11
	32	1.89	Tow 11
	30	1.66	Tow 11

Field Clam Collection Form

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Crew: _____

Date: 11/15/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g wwt)	Comments
LW3-CA-012W	15	0.41	Tow 1
LW3-CA-12W	—	—	Tow 2 - no clams
LW3-CA-12E	—	—	Tow 1 - only rocks, no clams
	17	0.53	Tow 2
	—	—	Tow 3 - rocks, no clams
	39 44	3.58	Tow 4
	44 25	1.15	Tow 4
	25 30	1.66	Tow 4
	30 29	1.55	Tow 4
	29 24	1.06	Tow 4
	24 39	2.81	Tow 4
	11	0.22	Tow 5
	—	—	Tow 6 - no clams
	—	—	Tow 7 - snagged
	—	—	Tow 8 - snagged
	—	—	Tow 9 - snagged
	34	2.14	Tow 10
	30	1.66	Tow 10
	13	0.31	Tow 10
	—	—	Tow 11 - no clams
	—	—	Tow 12 - snagged
	31	1.78	Tow 13
✓	36	2.40	Tow 13

Field Clam Collection Form

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Crew: E. Duffield
S. Fowler
F. Targen

Date: 11/15/07

Sample ID	Length of Corbicula sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-12E	32	1.89	Tow 13
	31	1.78	Tow 13
	31	1.78	Tow 13
	36	2.40	Tow 13
	13	0.31	Tow 13
	13	0.31	Tow 13
	11	0.22	Tow 13
	8	0.12	Tow 13
	30	1.66	Tow 13
	34	2.14	Tow 14
	37	2.53	Tow 14
	32	1.89	Tow 14
	24	1.06	Tow 14
	25	1.15	Tow 14
	20	0.74	Tow 14
	11	0.22	Tow 14
	11	0.22	Tow 14
	30	1.66	Tow 15
	36	2.40	Tow 15
	40	2.96	Tow 15
	38	2.67	Tow 15
	32	1.89	Tow 15
	25	1.15	Tow 15
	29	1.55	Tow 15

Field Clam Collection Form

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Crew: E. Duffield
S. Fowler
F. Tangen (boat driver)

Date: 11/15/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g ww)	Comments
<u>LW3-CA-12E</u>	<u>34</u>	<u>2.14</u>	<u>Tow 15</u>
	<u>32</u>	<u>1.89</u>	<u>Tow 15</u>
	<u>26</u>	<u>1.25</u>	<u>Tow 15</u>
	<u>32</u>	<u>1.89</u>	<u>Tow 15</u>
	<u>31</u>	<u>1.78</u>	<u>Tow 15</u>
	<u>27</u>	<u>1.35</u>	<u>Tow 15</u>
	<u>26</u>	<u>1.25</u>	<u>Tow 15</u>
	<u>19</u>	<u>0.67</u>	<u>Tow 15</u>
	<u>13</u>	<u>0.31</u>	<u>Tow 15</u>
	<u>10</u>	<u>0.18</u>	<u>Tow 15</u>
	<u>40</u>	<u>2.96</u>	<u>Tow 16</u>
	<u>42</u>	<u>3.26</u>	<u>Tow 16</u>
	<u>34</u>	<u>2.14</u>	<u>Tow 16</u>
	<u>35</u>	<u>2.26</u>	<u>Tow 16</u>
	<u>33</u>	<u>2.01</u>	<u>Tow 16</u>
	<u>30</u>	<u>1.66</u>	<u>Tow 16</u>
	<u>29</u>	<u>1.55</u>	<u>Tow 16</u>
	<u>25</u>	<u>1.15</u>	<u>Tow 16</u>
	<u>19</u>	<u>0.67</u>	<u>Tow 16</u>
	<u>12</u>	<u>0.27</u>	<u>Tow 16</u>
	<u>12</u>	<u>0.27</u>	<u>Tow 16</u>
	<u>9</u>	<u>0.15</u>	<u>Tow 16</u>
	<u>8</u>	<u>0.12</u>	<u>Tow 16</u>
<u>✓</u>	<u>40</u>		<u>Tow 17</u>

Field Clam Collection Form

Page 8 of 9

Crew: E. Duffield
S. Fowler
F. Tangen (boat driver)

Date: 11/15/07

Sample ID	Length of <i>Corbicula</i> sp. (mm)	Estimated Biomass (g wwt)	Comments
LW3-CA-12E	39		Tow 17
	38		Tow 17
	26		Tow 17
	20		Tow 17
	18		Tow 17
	26		Tow 18
	33		Tow 18
	35		Tow 18
	26		Tow 18
	26		Tow 18
	11		Tow 18
	9		Tow 18
	8		Tow 18
	8		Tow 18
	37		Tow 19
	33		Tow 19
	20		Tow 19
LW3-CA-05E	34		Tow 11
	41		Tow 11
	30		Tow 11
	29		Tow 11
	28		Tow 11
	27		Tow 11
	25		Tow 11

Field Clam Collection Form

Page 9 of 9

Crew: E. Duffield
S. Fowler
F. Tangen

Date: 4/15/07

Sample ID	Length of Corbicula sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-05E	29		Tow 11
	28		Tow 11
	32		Tow 11
	12		Tow 11
	9		Tow 11
	12		Tow 12
	10		Tow 12
	10		Tow 12
	9		Tow 12
	7		Tow 12
	30		Tow 13
	26		Tow 13
	19		Tow 13
	29		Tow 14
	28		Tow 14
	30		Tow 14
	26		Tow 15
	26		Tow 15
	34		Tow 15
	31		Tow 15

Field Clam Collection Form

Page 1 of 6

Crew: E. Duffield
S. Fowler
F. Tangen

Date: 11/16/07

Sample ID	Length of Corbicula sp. (mm)	Estimated Biomass (g ww)	Comments
WS-CA-12W	-	-	Tow 3 - no clams
	-	-	Tow 4 - no clams
	-	-	Tow 5 - snagged / empty
	-	-	Tow 6 - no clams
	-	-	Tow 7 - snagged no clams
	-	-	Tow 8 - snagged
	-	-	Tow 9 - no clams
	-	-	Tow 10 - no clams
	-	-	Tow 11 - snagged
	-	-	Tow 12 - no clams
	27 27	1.35	Tow 13 - Moved to deeper water /
	25 25	1.15	Tow 13 new channel for
	19 19	0.67	Tow 13 sledging.
	16 16	0.47	Tow 13
	9	0.15	Tow 13
	33	2.01	Tow 14
	31	1.78	Tow 14
	24	1.06	Tow 14
	14	0.36	Tow 14
	13	0.31	Tow 14
	10	0.18	Tow 14
	7	0.09	Tow 14
	22	0.89	Tow 15
	7	0.09	Tow 15

206-399-6095

Lisa S. Cell

Field Clam Collection Form

Page 2 of 6

Crew: E. Duffield
S. Fowler
E. Tangen

Date: ~~11/16/07~~
11/16/07

Sample ID	Length of Corbicula sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-012W	10	0.13	Tow 16
	10	0.18	Tow 16
	7	0.09	Tow 16
	6	0.07	Tow 16
	6	0.07	Tow 16
	16	0.47	Tow 17
	15	0.41	Tow 17
	8	0.12	Tow 17
	8	0.12	Tow 17
	5	0.05	Tow 17
	17	0.53	Tow 18
	12	0.27	Tow 18
	8	0.12	Tow 18
	7	0.09	Tow 18
	7	0.09	Tow 18
	6	0.07	Tow 18
	6	0.07	Tow 18
	—	—	Tow 19 no clams
	—	—	Tow 20 - snagged/empty
	2.4	1.06	Tow 21
	3.5	2.26	Tow 22
	11	0.47	Tow 22
	13	0.31	Tow 22
	13	0.31	Tow 22

Field Clam Collection Form

Page 3 of 6

Crew: E. Duffield
S. Fowler
F. Tangen

Date: 11/16/07

Sample ID	Length of Corbicula sp. (mm)	Estimated Biomass (g ww)	Comments
W3-CA-12W	6	0.07	Tow 22
	31	1.78	Tow 22
	22	0.89	Tow 22
	12	0.27	Tow 22
	7	0.09	Tow 22
	28	1.45	Tow 23
	26	1.25	Tow 23
	7	0.09	Tow 23
	26	1.25	Tow 23
	19	0.67	Tow 23
	23	0.98	Tow 24
	23	0.98	Tow 25
	14	0.47	Tow 25
	15	0.41	Tow 25
	26 26	1.25	Tow 26
	5	0.05	Tow 26
	5	0.05	Tow 26
	24	1.06	Tow 27
	7	0.09	Tow 27
	34	2.14	Tow 1
W3-CA-10W	34	2.14	Tow 1
	31	1.78	Tow 1
	40	2.96	Tow 2
	38	2.67	Tow 2

Field Clam Collection Form

Page 4 of 6

Crew: E. Duffield
S. Fowler
F. Tangen

Date: 4/16/07

Sample ID	Length of Corbicula sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-10W	27	1.35	Tow 2
	24	1.06	Tow 2
	27	1.35	Tow 3
	29	1.55	Tow 3
	31	1.78	Tow 3
	42	3.26	Tow 3
	45	3.74	Tow 3
	33	2.01	Tow 4
	33	2.01	Tow 4
	32	1.89	Tow 4
	24	1.35	Tow 4
	20	0.74	Tow 4
	25	1.15	Tow 4
	23	0.98	Tow 4
	27	1.35	Tow 5
	29	1.55	Tow 5
	33	2.01	Tow 6
	—	—	Tow 7 - snagged
	39	2.81	Tow 8
	32	1.89	Tow 8
	36	2.40	Tow 9
	30	1.66	Tow 9
	30	1.66	Tow 9
	29	1.55	Tow 9

Field Clam Collection Form

Page 5 of 6

Crew: E. DUFFIELD
S. FOWLER
F. Tanager

Date: 11/16/07

Sample ID	Length of Corbicula sp. (mm)	Estimated Biomass (g ww)	Comments
LW3-CA-10W	18 18	0.60	Tow 10
	33	2.01	Tow 11
	33	2.01	Tow 11
	34	2.14	Tow 11
	32	1.89	Tow 12
	32	1.89	Tow 12
	29	1.55	Tow 12
	27	1.35	Tow 12
	26	1.25	Tow 12
	30		Tow 13
	28		Tow 13
	32		Tow 13
	30		14 Tow 14
	31		Tow 14
	29		Tow 14
	27		Tow 14
	36		Tow 15
	28		Tow 15
	33		Tow 16
	33		Tow 16
	32		Tow 16
LW3-CA-12W	—	—	Tow 18 no clams
	37	2.53	Tow 19
	38	—	Tow 20 no clams

Field Clam Collection Form

Page 6 of 6

Crew: E. DUFFIELD
S. FOWLER
F. TANGEN

Date: 11/16/07

[illegible]

242a
Vaughn St.



PORTLAND HARBOR RI/FS

**ROUND 3B FISH AND INVERTEBRATE TISSUE
AND COLLOCATED SURFACE SEDIMENT
FIELD SAMPLING REPORT**

APPENDIX F

**FISH AND INVERTEBRATE TISSUE AND
COLLOCATED SEDIMENT MASTER TABLE**

DRAFT

DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

February 15, 2008

Prepared for
The Lower Willamette Group

Prepared by
Integral Consulting Inc.
Windward Environmental LLC

Table F-1. Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	Sample Code	Sampler Initials	State Plane ORNZ83FT X Easting	State Plane ORNZ83FT Y Northing	NAD83 Latitude Dec. Min.	NAD83 Longitude Dec. Min.	Map Key	Method	Key Day	Site_ Round	Station	Matrix	Species	Tissue	Sample	Excluded Samples
10/15/07	13:12	LW3-GCR01E-ALT-A-1	SW + JR	7621154.14663	728389.984948	45 38.5301680	122 46.3050041	CR01E-ALT-	van Veen grab	VG	LW3	CR01E-ALT	SD	Sediment			
10/15/07	13:28	LW3-GCR01E-ALT-B-1	SW + JR	7621164.90870	728391.292726	45 38.5304329	122 46.3024890	CR01E-ALT-	van Veen grab	VG	LW3	CR01E-ALT	SD	Sediment			
10/15/07	13:40	LW3-GCR01E-ALT-C-1	SW + JR	7621204.97866	728423.397039	45 38.5358991	122 46.2933042	CR01E-ALT-	van Veen grab	VG	LW3	CR01E-ALT	SD	Sediment			
10/15/07	14:04	LW3-GSP01E-A-1	SW + JR	7619730.41832	727234.303610	45 38.3334763	122 46.6312314	SP01E-	van Veen grab	VG	LW3	SP01E	SD	Sediment			
10/15/07	14:24	LW3-GSP01E-B-1	SW + JR	7619698.24537	727211.856760	45 38.3296348	122 46.6386272	SP01E-	van Veen grab	VG	LW3	SP01E	SD	Sediment			
10/15/07	14:36	LW3-GSP01E-C-1	SW + JR	7619666.04948	727187.406777	45 38.3254637	122 46.6460151	SP01E-	van Veen grab	VG	LW3	SP01E	SD	Sediment			
10/16/07	8:57	LW3-GCRSP01W-A-4	SW + JR	7618514.13511	728020.374783	45 38.4571301	122 46.9216420	CRSP01W-	van Veen grab	VG	LW3	CRSP01W	SD	Sediment			
10/16/07	9:16	LW3-GCRSP01W-B-2	SW + JR	7618477.33552	727984.182225	45 38.4510058	122 46.9300314	CRSP01W-	van Veen grab	VG	LW3	CRSP01W	SD	Sediment			
10/16/07	9:32	LW3-GCRSP01W-C-2	SW + JR	7618439.73396	727957.205369	45 38.4463937	122 46.9386702	CRSP01W-	van Veen grab	VG	LW3	CRSP01W	SD	Sediment			
10/16/07	10:25	LW3-GSP03E-A-5	SW + JR	7617545.59201	717843.227042	45 36.7785921	122 47.0812652	SP03E-	van Veen grab	VG	LW3	SP03E	SD	Sediment			
10/16/07	10:40	LW3-GSP03E-B-1	SW + JR	7617531.85118	717789.834299	45 36.7697456	122 47.0841319	SP03E-	van Veen grab	VG	LW3	SP03E	SD	Sediment			
10/16/07	10:54	LW3-GSP03E-C-1	SW + JR	7617539.64858	717725.573145	45 36.7592115	122 47.0818782	SP03E-	van Veen grab	VG	LW3	SP03E	SD	Sediment			
10/16/07	12:26	LW3-GSP04W-A-1	SW + JR	7618168.64700	712645.399500	45 35.3264949	122 46.9008227	SP04W-	van Veen grab	VG	LW3	SP04W	SD	Sediment			
10/16/07	12:13	LW3-GSP04W-B-2	SW + JR	7618134.86300	712676.928900	45 35.9315242	122 46.9089478	SP04W-	van Veen grab	VG	LW3	SP04W	SD	Sediment			
10/16/07	11:48	LW3-GSP04W-C-2	SW + JR	7618117.93000	712721.199600	45 35.9387277	122 46.9132086	SP04W-	van Veen grab	VG	LW3	SP04W	SD	Sediment			
10/16/07	14:35	LW3-GSP05E-A-2	SW + JR	7621757.64707	709139.278370	45 35.3663901	122 46.0367781	SP05E-	van Veen grab	VG	LW3	SP05E	SD	Sediment			
10/16/07	14:52	LW3-GSP05E-B-2	SW + JR	7621759.90170	709107.941184	45 35.3612458	122 46.0360437	SP05E-	van Veen grab	VG	LW3	SP05E	SD	Sediment			
10/16/07	14:40	LW3-GSP05E-C-10	SW + JR	7621785.87879	709045.800384	45 35.3511440	122 46.0295491	SP05E-	van Veen grab	VG	LW3	SP05E	SD	Sediment			
10/16/07	13:37	LW3-GCR05W-A-1	SW + JR	7621416.49309	707830.265981	45 35.1494919	122 46.1080930	CR05W-	van Veen grab	VG	LW3	CR05W	SD	Sediment			
10/16/07	13:52	LW3-GCR05W-B-1	SW + JR	7621387.84775	707872.185138	45 35.1562549	122 46.1150795	CR05W-	van Veen grab	VG	LW3	CR05W	SD	Sediment			
10/16/07	14:09	LW3-GCR05W-C-2	SW + JR	7621368.98100	707917.679230	45 35.1636512	122 46.1197988	CR05W-	van Veen grab	VG	LW3	CR05W	SD	Sediment			
10/17/07	9:20	LW3-GCRSP06W-A-1	SW + JR	7624477.13820	705322.109672	45 34.7510180	122 45.3746625	CRSP06W-	van Veen grab	VG	LW3	CRSP06W	SD	Sediment			
10/17/07	9:50	LW3-GCRSP06W-B-1	SW + JR	7624560.89372	705329.743770	45 34.7526585	122 45.3550931	CRSP06W-	van Veen grab	VG	LW3	CRSP06W	SD	Sediment			
10/17/07	10:05	LW3-GCRSP06W-C-1	SW + JR	7624604.98728	705294.170035	45 34.7470094	122 45.3445319	CRSP06W-	van Veen grab	VG	LW3	CRSP06W	SD	Sediment			
10/17/07	10:32	LW3-GSP07E-A-3	SW + JR	7629626.95305	703235.060868	45 34.4312633	122 44.1548145	SP07E-	van Veen grab	VG	LW3	SP07E	SD	Sediment			
10/17/07	10:57	LW3-GSP07E-B-3	SW + JR	7629640.57398	703264.213645	45 34.4361207	122 44.1518131	SP07E-	van Veen grab	VG	LW3	SP07E	SD	Sediment			
10/17/07	11:12	LW3-GSP07E-C-2	SW + JR	7629593.87769	703299.983450	45 34.4417921	122 44.1629823	SP07E-	van Veen grab	VG	LW3	SP07E	SD	Sediment			
10/15/07	15:36	LW3-GSP07W-A-1	SW + JR	7628777.81414	700395.536432	45 33.9603068	122 44.3352686	SP07W-	van Veen grab	VG	LW3	SP07W	SD	Sediment			
10/15/07	15:56	LW3-GSP07W-B-1	SW + JR	7628812.13480	700374.300903	45 33.9569701	122 44.3270931	SP07W-	van Veen grab	VG	LW3	SP07W	SD	Sediment			
10/15/07	16:19	LW3-GSP07W-C-1	SW + JR	7628844.72340	700340.621488	45 33.9515786	122 44.3192428	SP07W-	van Veen grab	VG	LW3	SP07W	SD	Sediment			
10/15/07	9:30	LW3-GSP08E-A-1	SW + JR	7633718.29443	701705.330414	45 34.1981889	122 43.1866793	SP08E-	van Veen grab	VG	LW3	SP08E	SD	Sediment			
10/15/07	10:23	LW3-GSP08E-B-4	SW + JR	7633761.08957	701685.333578	45 34.1950929	122 43.1765274	SP08E-	van Veen grab	VG	LW3	SP08E	SD	Sediment			
10/15/07	9:47	LW3-GSP08E-C-1	SW + JR	7633787.00805	701644.072242	45 34.1884227	122 43.1701917	SP08E-	van Veen grab	VG	LW3	SP08E	SD	Sediment			
10/15/07	10:57	LW3-GCRSP08W-A-1	SW + JR	7633130.00654	696929.474037	45 33.4099177	122 43.2936999	CRSP08W-	van Veen grab	VG	LW3	CRSP08W	SD	Sediment			
10/15/07	11:24	LW3-GCRSP08W-B-1	SW + JR	7633170.67137	696893.595200	45 33.4041997	122 43.2839473	CRSP08W-	van Veen grab	VG	LW3	CRSP08W	SD	Sediment			
10/15/07	12:00	LW3-GCRSP08W-C-1	SW + JR	7633231.44081	696877.562091	45 33.4018372	122 43.2696146	CRSP08W-	van Veen grab	VG	LW3	CRSP08W	SD	Sediment			
10/17/07	12:15	LW3-GSP09W-A-1	SW + JR	7635291.16159	695685.732455	45 33.2150833	122 42.7796785	SP09W-	van Veen grab	VG	LW3	SP09W	SD	Sediment			
10/17/07	13:00	LW3-GSP09W-B-6	SW + JR	7635246.16355	695728.630651	45 33.2219371	122 42.7904895	SP09W-	van Veen grab	VG	LW3	SP09W	SD	Sediment			
10/17/07	13:11	LW3-GSP09W-C-3	SW + JR	7635205.12652	695763.116962	45 33.2274251	122 42.8003192	SP09W-	van Veen grab	VG	LW3	SP09W	SD	Sediment			
10/17/07	13:38	LW3-GSP10E-A-1	SW + JR	7639795.29123	694809.308483	45 33.0911285	122 41.7194954	SP10E-	van Veen grab	VG	LW3	SP10E	SD	Sediment			
10/17/07	14:10	LW3-GSP10E-B-3	SW + JR	7639801.82065	694771.843673	45 33.0849948	122 41.7177281	SP10E-	van Veen grab	VG	LW3	SP10E	SD	Sediment			
10/17/07	14:20	LW3-GSP10E-C-1	SW + JR	7639829.70723	694756.764634	45 33.0826389	122 41.7111032	SP10E-	van Veen grab	VG	LW3	SP10E	SD	Sediment			
10/17/07	14:49	LW3-GCR10W-A-1	SW + JR	7639589.16216	692863.882057	45 32.7701873	122 41.7553755	CR10W-	van Veen grab	VG	LW3	CR10W	SD	Sediment			
10/17/07	15:00	LW3-GCR10W-B-1	SW + JR	7639558.08560	692912.701630	45 32.7780791	122 41.7629614	CR10W-	van Veen grab	VG	LW3	CR10W	SD	Sediment			
10/17/07	16:14	LW3-GCR10W-C-6	SW + JR	7639528.75872	692939.109906	45 32.7822920	122 41.7699953	CR10W-	van Veen grab	VG	LW3	CR10W	SD	Sediment			
10/18/07	9:05	LW3-GSP10W-A-1	SW + JR	7639811.21413	692630.359371	45 32.7327658	122 41.7019050	SP10W-	van Veen grab	VG	LW3	SP10W	SD	Sediment			
10/18/07	9:24	LW3-GSP10W-B-2	SW + JR	7639848.33188	692576.000983	45 32.7239898	122 41.6928696	SP10W-	van Veen grab	VG	LW3	SP10W	SD	Sediment			
10/18/07	9:37	LW3-GSP10W-C-2	SW + JR	7639873.54464	692527.603825	45 32.7161412	122 41.6866592	SP10W-	van Veen grab	VG	LW3	SP10W	SD	Sediment			
10/18/07	10:58	LW3-GCRSP11E-A-5	SW + JR	7644327.80053	689220.560259	45 32.1919605	122 40.6230121	CRSP11E-	van Veen grab	VG	LW3	CRSP11E	SD	Sediment			
10/18/07	11:08	LW3-GCRSP11E-B-3	SW + JR	7644355.52261	689209.911142	45 32.1903316	122 40.6164560	CRSP11E-	van Veen grab	VG	LW3	CRSP11E	SD	Sediment			
10/18/07	11:33	LW3-GCRSP11E-C-6	SW + JR	7644388.18511	689198.113367	45 32.1885356	122 40.6087363	CRSP11E-	van Veen grab	VG	LW3	CRSP11E	SD	Sediment			
10/18/07	16:36	LW3-GSP12W-ALT-A-4	SW + JR	7645679.10130	686243.275576	45 31.7081785	122 40.2879755	SP12W-ALT-	van Veen grab	VG	LW3	SP12W-ALT	SD	Sediment			
10/18/07	16:54	LW3-GSP12W-ALT-B-6	SW + JR	7645685.12334	686293.356930	45 31.7164436	122 40.2868812	SP12W-ALT-	van Veen grab	VG	LW3	SP12W-ALT	SD	Sediment			
10/18/07	17:11	LW3-GSP12W-ALT-C-6	SW + JR	7645633.12558	686325.164907	45 31.7214461	122 40.2992507	SP12W-ALT-	van Veen grab	VG	LW3	SP12W-ALT	SD	Sediment			
10/18/07	14:42	LW3-GCR12W-A-1	SW + JR	7645855.105850	685845.105850	45 31.6434586	122 40.2442159	CR12W-	van Veen grab	VG	LW3	CR12W	SD	Sediment			
10/18/07	14:53	LW3-GCR12W-B-1	SW + JR	7645877.84916	685815.368398	45 31.6386661	122 40.2387694	CR12W-	van Veen grab	VG	LW3	CR12W	SD	Sediment			
10/18/07	15:15	LW3-GCR12W-C-6	SW + JR	7645881.73713	685786.583302	45 31.6339481	122 40.2376785	CR12W-	van Veen grab	VG	LW3	CR12W	SD	Sediment			
10/18/07	13:58	LW3-GCRSP12E-A-13	SW + JR	7646985.11321	685657.770408	45 31.6176302	122 39.9786406	CRSP12E-	van Veen grab	VG	LW3	CRSP12E	SD	Sediment			
10/18/07	13:41	LW3-GCRSP12E-B-10	SW + JR	7647015.20981	685662.529646	45 31.6185458	122 39.9716268	CRSP12E-	van Veen grab	VG	LW3	CRSP12E	SD	Sediment			
10/18/07	12:46	LW3-GCRSP12E-C-1	SW + JR	7647010.60350	685652.596933	45 31.6168916	122 39.9726424	CRSP12E-	van Veen grab	VG	LW3	CRSP12E	SD	Sediment			
11/19/07	11:33	LW3-GCA01E-1d	JS + SP	7618945.90800	726513.731000	45 38.2113094	122 46.8104202	CA01E-	van Veen grab	VG	LW3	CA01E	SD	CA	WB		

Table F-1. Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	Sample Code	Sampler Initials	State Plane ORNZ83FT X Easting	State Plane ORNZ83FT Y Northing	NAD83 Latitude Dec. Min.	NAD83 Longitude Dec. Min.	Map Key	Method	Key Day	Site_ Round	Station	Matrix	Species	Tissue	Sample	Excluded Samples
11/19/07	11:39	LW3-GCA01E-2a	JS + SP	7618897.34900	726509.877000	45 38.2104500	122 46.8217808	CA01E-	van Veen grab	VG	LW3	CA01E	SD	CA	WB		
11/19/07	11:46	LW3-GCA01E-3a	JS + SP	7618903.05400	726482.782000	45 38.2060196	122 46.8202637	CA01E-	van Veen grab	VG	LW3	CA01E	SD	CA	WB		
11/19/07	11:53	LW3-GCA01E-4a	JS + SP	7618874.28200	726492.486000	45 38.2074822	122 46.8270744	CA01E-	van Veen grab	VG	LW3	CA01E	SD	CA	WB		
11/19/07	12:00	LW3-GCA01E-5a	JS + SP	7618891.08100	726454.059000	45 38.2012394	122 46.8228810	CA01E-	van Veen grab	VG	LW3	CA01E	SD	CA	WB		
11/19/07	12:06	LW3-GCA01E-6a	JS + SP	7618856.12800	726438.247000	45 38.1984762	122 46.8309721	CA01E-	van Veen grab	VG	LW3	CA01E	SD	CA	WB		
11/19/07	9:43	LW3-GCA02W-1e	JS + SP	7615352.24900	724043.628000	45 37.7882675	122 47.6366083	CA02W-	van Veen grab	VG	LW3	CA02W	SD	CA	WB		
11/19/07	9:55	LW3-GCA02W-2a	JS + SP	7615346.88400	724037.467000	45 37.7872291	122 47.6378251	CA02W-	van Veen grab	VG	LW3	CA02W	SD	CA	WB		
11/19/07	10:02	LW3-GCA02W-3a	JS + SP	7615383.12700	723988.802000	45 37.7793935	122 47.6290040	CA02W-	van Veen grab	VG	LW3	CA02W	SD	CA	WB		
11/19/07	10:10	LW3-GCA02W-4a	JS + SP	7615323.08200	723997.782000	45 37.7805901	122 47.6431412	CA02W-	van Veen grab	VG	LW3	CA02W	SD	CA	WB		
11/19/07	10:20	LW3-GCA02w-5a	JS + SP	7615346.33700	723924.470000	45 37.7686398	122 47.6372010	CA02W-	van Veen grab	VG	LW3	CA02W	SD	CA	WB		
11/19/07	10:27	LW3-GCA02W-6a	JS + SP	7615355.31600	723880.356000	45 37.7614254	122 47.6348022	CA02W-	van Veen grab	VG	LW3	CA02W	SD	CA	WB		
11/21/07	10:57	LW3-GCA03W-1a	JS + SP	7615645.69200	718211.094000	45 36.8302487	122 47.5290099	CA03W-	van Veen grab	VG	LW3	CA03W	SD	CA	WB		
11/21/07	11:02	LW3-GCCA03W-2a	JS + SP	7615675.84800	718177.215000	45 36.8248167	122 47.5217165	CA03W-	van Veen grab	VG	LW3	CA03W	SD	CA	WB		
11/21/07	11:07	LW3-GCA03W-3a	JS + SP	7615717.90000	718189.007000	45 36.8269526	122 47.5119387	CA03W-	van Veen grab	VG	LW3	CA03W	SD	CA	WB		
11/21/07	11:12	LW3-GCA03W-4a	JS + SP	7615716.76700	718145.245000	45 36.8197489	122 47.5119132	CA03W-	van Veen grab	VG	LW3	CA03W	SD	CA	WB		
11/21/07	11:28	LW3-GCA03W-5c	JS + SP	7615730.13800	718110.758000	45 36.8141386	122 47.5085500	CA03W-	van Veen grab	VG	LW3	CA03W	SD	CA	WB		
11/21/07	11:38	LW3-GCA03W-6b	JS + SP	7615754.85700	718113.586000	45 36.8147191	122 47.5027751	CA03W-	van Veen grab	VG	LW3	CA03W	SD	CA	WB		
11/19/07	13:50	LW3-GCA04W-1f	JS + SP	7616934.04000	715226.090000	45 36.3452518	122 47.2072363	CA04W-	van Veen grab	VG	LW3	CA04W	SD	CA	WB		
11/19/07	14:00	LW3-GCA04W-2a	JS + SP	7616961.80000	715206.020000	45 36.3420797	122 47.2005976	CA04W-	van Veen grab	VG	LW3	CA04W	SD	CA	WB		
11/19/07	14:15	LW3-GCA04W-3c	JS + SP	7616962.91000	715195.240000	45 36.3403117	122 47.2002659	CA04W-	van Veen grab	VG	LW3	CA04W	SD	CA	WB		
11/19/07	14:22	LW3-GCA04W-4a	JS + SP	7616909.10000	715218.520000	45 36.3438904	122 47.2130308	CA04W-	van Veen grab	VG	LW3	CA04W	SD	CA	WB		
11/19/07	14:39	LW3-GCA04W-5d	JS + SP	7615930.00000	715159.590000	45 36.3342944	122 47.2077419	CA04W-	van Veen grab	VG	LW3	CA04W	SD	CA	WB		
11/19/07	14:48	LW3-GCA04W-6a	JS + SP	7616885.39000	715148.950000	45 36.3323364	122 47.2181256	CA04W-	van Veen grab	VG	LW3	CA04W	SD	CA	WB		
11/19/07	15:20	LW3-GCA05E-1a	JS + SP	7621651.56000	709293.480000	45 35.3912652	122 46.0626468	CA05E-	van Veen grab	VG	LW3	CA05E	SD	CA	WB		
11/19/07	15:27	LW3-GCA05E-2a	JS + SP	7621623.89000	709279.790000	45 35.3888856	122 46.0690394	CA05E-	van Veen grab	VG	LW3	CA05E	SD	CA	WB		
11/19/07	15:33	LW3-GCA05E-3a	JS + SP	7621654.80000	709210.900000	45 35.3776964	122 46.0613446	CA05E-	van Veen grab	VG	LW3	CA05E	SD	CA	WB		
11/19/07	15:43	LW3-GCA05E-4b	JS + SP	7621695.76000	709205.020000	45 35.3769183	122 46.0517096	CA05E-	van Veen grab	VG	LW3	CA05E	SD	CA	WB		
11/19/07	15:49	LW3-GCA05E-5a	JS + SP	7621730.70000	709194.980000	45 35.3754282	122 46.0434576	CA05E-	van Veen grab	VG	LW3	CA05E	SD	CA	WB		
11/19/07	16:18	LW3-GCA05E-6o	JS + SP	7621757.19000	709120.100000	45 35.3632333	122 46.0367590	CA05E-	van Veen grab	VG	LW3	CA05E	SD	CA	WB		
11/21/07	9:15	LW3-GCA05W-1b	JS + SP	7621454.05800	707886.529000	45 35.1589202	122 46.0996628	CA05W-	van Veen grab	VG	LW3	CA05W	SD	CA	WB		
11/21/07	9:28	LW3-GCA05W-2b	JS + SP	7621556.02300	707869.926000	45 35.1566601	122 46.0756662	CA05W-	van Veen grab	VG	LW3	CA05W	SD	CA	WB		
11/21/07	9:34	LW3-GCA05w-3a	JS + SP	7621523.18600	707778.594000	45 35.1414850	122 46.0827582	CA05W-	van Veen grab	VG	LW3	CA05W	SD	CA	WB		
11/21/07	9:47	LW3-GCA05W-4b	JS + SP	7621610.66600	707802.476000	45 35.1458174	122 46.0624214	CA05W-	van Veen grab	VG	LW3	CA05W	SD	CA	WB		
11/21/07	9:52	LW3-GCA05W-5a	JS + SP	7621651.40200	707724.971000	45 35.1332565	122 46.0523686	CA05W-	van Veen grab	VG	LW3	CA05W	SD	CA	WB		
11/21/07	10:01	LW3-GCA05W-6c	JS + SP	7621667.09100	707690.579000	45 35.1276718	122 46.0484670	CA05W-	van Veen grab	VG	LW3	CA05W	SD	CA	WB		
11/21/07	10:17	LW3-GCA05W-7e	JS + SP	7621701.89900	707661.393000	45 35.1230316	122 46.0401207	CA05W-	van Veen grab	VG	LW3	CA05W	SD	CA	WB		
11/20/07	14:10	LW3-GCA10W-1E	IS + SP	7639516.54300	692962.529000	45 32.7860898	122 41.7730043	CA10W-	van Veen grab	VG	LW3	CA10W	SD	CA	WB		
11/20/07	14:30	LW3-GCA10W-2E	IS + SP	7639606.92300	692867.939000	45 32.7709340	122 41.7512433	CA10W-	van Veen grab	VG	LW3	CA10W	SD	CA	WB		
11/20/07	14:35	LW3-GCA10W-3A	IS + SP	7639615.52700	692850.688000	45 32.7681348	122 41.7491192	CA10W-	van Veen grab	VG	LW3	CA10W	SD	CA	WB		
11/20/07	14:40	LW3-GCA10W-4A	IS + SP	7639626.25200	692825.907000	45 32.7641063	122 41.7464507	CA10W-	van Veen grab	VG	LW3	CA10W	SD	CA	WB		
11/20/07	14:46	LW3-GCA10W-5A	IS + SP	7639619.59800	692816.805000	45 32.7625792	122 41.7479505	CA10W-	van Veen grab	VG	LW3	CA10W	SD	CA	WB		
11/20/07	14:50	LW3-GCA10W-6A	IS + SP	7639644.63000	692813.802000	45 32.7621972	122 41.7420711	CA10W-	van Veen grab	VG	LW3	CA10W	SD	CA	WB		
11/20/07	14:59	LW3-GCA10W-7B	IS + SP	7639661.69700	692770.600000	45 32.7551668	122 41.7378007	CA10W-	van Veen grab	VG	LW3	CA10W	SD	CA	WB		
12/6/07	13:47	LW3-GCA11E-1-G1	JS + SP	7644149.66800	689249.371000	45 32.1959101	122 40.6648901	CA11E-	power grab	PG	LW3	CA11E	SD	CA	WB		
12/6/07	14:26	LW3-GCA11E-2-G3	JS + SP	7644160.46200	689232.970000	45 32.1932600	122 40.6622600	CA11E-	power grab	PG	LW3	CA11E	SD	CA	WB		
12/6/07	14:41	LW3-GCA11E-3-G1	JS + SP	7644174.53800	689219.460000	45 32.1911000	122 40.6588800	CA11E-	power grab	PG	LW3	CA11E	SD	CA	WB		
12/6/07	14:56	LW3-GCA11E-4-G1	JS + SP	7644190.01600	689207.250000	45 32.1891601	122 40.6551799	CA11E-	power grab	PG	LW3	CA11E	SD	CA	WB		
12/6/07	15:08	LW3-GCA11E-5-G1	JS + SP	7644210.27900	689190.290000	45 32.1864600	122 40.6503299	CA11E-	power grab	PG	LW3	CA11E	SD	CA	WB		
12/6/07	16:20	LW3-GCA12E-1-G1	JS + SP	7646983.06500	685654.602000	45 31.6171000	122 39.9791000	CA12E-	power grab	PG	LW3	CA12E	SD	CA	WB		
12/6/07	16:42	LW3-GCA12E-2-G1	JS + SP	7647002.80100	685620.943000	45 31.6116501	122 39.9742699	CA12E-	power grab	PG	LW3	CA12E	SD	CA	WB		
12/6/07	17:45	LW3-GCA12E-3-G4	JS + SP	7646976.75500	685634.407000	45 31.6137500	122 39.9804501	CA12E-	power grab	PG	LW3	CA12E	SD	CA	WB		
11/20/07	12:08	LW3-GCA12W-1A	IS + SP	7645743.03200	686131.842000	45 31.6901303	122 40.2723121	CA12W-	van Veen grab	VG	LW3	CA12W	SD	CA	WB		
11/20/07	12:15	LW3-GCA12W-2A	IS + SP	7645758.24800	686101.884000	45 31.6852694	122 40.2685625	CA12W-	van Veen grab	VG	LW3	CA12W	SD	CA	WB		
11/20/07	12:22	LW3-GCA12W-3A	IS + SP	7645775.09100	686069.916000	45 31.6800851	122 40.2644195	CA12W-	van Veen grab	VG	LW3	CA12W	SD	CA	WB		
11/20/07	12:29	LW3-GCA12W-4A	IS + SP	7645794.09800	686064.877000	45 31.6793402	122 40.2599395	CA12W-	van Veen grab	VG	LW3	CA12W	SD	CA	WB		
11/20/07	12:38	LW3-GCA12W-5B	IS + SP	7645808.63500	686025.428000	45 31.6729151	122 40.2562891	CA12W-	van Veen grab	VG	LW3	CA12W	SD	CA	WB		
11/20/07	13:00	LW3-GCA12W-6G	IS + SP	7645828.22900	686004.711000	45 31.6695938	122 40.2515731	CA12W-	van Veen grab	VG	LW3	CA12W	SD	CA	WB		

Table F-1. Round 3B Collected Fish and Invertebr:

Date	Time	Sample Code	Lab Weight (g)	Lab Total Length (mm)	Lab Fork Length (mm)	Lab Body Weight (g)	Lab Fillet Weight (g)	Comp #	Comp sample code	SentToLab	Packer	Species Name	Grab Penetration Depth (cm)	Water Depth (ft) a	Grab Number	Tow #	Tow line out (ft)	Tow Scope	Tow duration (sec)	Estimated Total biomass (g)	Total # of clams per tow
10/15/07	13:12	LW3-GCR01E-ALT-A-1							LW3-GCR01E-C00		MT		10	--	1						
10/15/07	13:28	LW3-GCR01E-ALT-B-1							LW3-GCR01E-C00		MT		11	--	1						
10/15/07	13:40	LW3-GCR01E-ALT-C-1							LW3-GCR01E-C00		MT		13	--	1						
10/15/07	14:04	LW3-GSP01E-A-1							LW3-GSP01E-C00		MT		14	--	1						
10/15/07	14:24	LW3-GSP01E-B-1							LW3-GSP01E-C00		MT		11	--	1						
10/15/07	14:36	LW3-GSP01E-C-1							LW3-GSP01E-C00		MT		15	--	1						
10/16/07	8:57	LW3-GCRSP01W-A-4							LW3-GCRSP01W-C00		MT		11	11	4						
10/16/07	9:16	LW3-GCRSP01W-B-2							LW3-GCRSP01W-C00		MT		19	--	2						
10/16/07	9:32	LW3-GCRSP01W-C-2							LW3-GCRSP01W-C00		MT		13	--	2						
10/16/07	10:25	LW3-GSP03E-A-5							LW3-GSP03E-C00		MT		10	--	5						
10/16/07	10:40	LW3-GSP03E-B-1							LW3-GSP03E-C00		MT		19	--	1						
10/16/07	10:54	LW3-GSP03E-C-1							LW3-GSP03E-C00		MT		13	--	1						
10/16/07	12:26	LW3-GSP04W-A-1							LW3-GSP04W-C00		MT		14	--	1						
10/16/07	12:13	LW3-GSP04W-B-2							LW3-GSP04W-C00		MT		10	--	2						
10/16/07	11:48	LW3-GSP04W-C-2							LW3-GSP04W-C00		MT		10	--	2						
10/16/07	14:35	LW3-GSP05E-A-2							LW3-GSP05E-C00		MT		10	--	2						
10/16/07	14:52	LW3-GSP05E-B-2							LW3-GSP05E-C00		MT		15	--	2						
10/16/07	14:40	LW3-GSP05E-C-10							LW3-GSP05E-C00		MT		18	--	10						
10/16/07	13:37	LW3-GCR05W-A-1							LW3-GCR05W-C00		MT		17	--	1						
10/16/07	13:52	LW3-GCR05W-B-1							LW3-GCR05W-C00		MT		11	--	1						
10/16/07	14:09	LW3-GCR05W-C-2							LW3-GCR05W-C00		MT		15	--	2						
10/17/07	9:20	LW3-GCRSP06W-A-1							LW3-GCRSP06W-C00		MT		18	--	1						
10/17/07	9:50	LW3-GCRSP06W-B-1							LW3-GCRSP06W-C00		MT		17	--	1						
10/17/07	10:05	LW3-GCRSP06W-C-1							LW3-GCRSP06W-C00		MT		13	--	1						
10/17/07	10:32	LW3-GSP07E-A-3							LW3-GSP07E-C00		MT		19	--	3						
10/17/07	10:57	LW3-GSP07E-B-3							LW3-GSP07E-C00		MT		19	--	3						
10/17/07	11:12	LW3-GSP07E-C-2							LW3-GSP07E-C00		MT		19	--	2						
10/15/07	15:36	LW3-GSP07W-A-1							LW3-GSP07W-C00		MT		19	30	1						
10/15/07	15:56	LW3-GSP07W-B-1							LW3-GSP07W-C00		MT		12	30	1						
10/15/07	16:19	LW3-GSP07W-C-1							LW3-GSP07W-C00		MT		16	23	1						
10/15/07	9:30	LW3-GSP08E-A-1							LW3-GSP08E-C00		MT		12	--	1						
10/15/07	10:23	LW3-GSP08E-B-4							LW3-GSP08E-C00		MT		10	--	4						
10/15/07	9:47	LW3-GSP08E-C-1							LW3-GSP08E-C00		MT		10	--	1						
10/15/07	10:57	LW3-GCRSP08W-A-1							LW3-GCRSP08W-C00		MT		19	--	1						
10/15/07	11:24	LW3-GCRSP08W-B-1							LW3-GCRSP08W-C00		MT		19	--	1						
10/15/07	12:00	LW3-GCRSP08W-C-1							LW3-GCRSP08W-C00		MT		19	--	1						
10/17/07	12:15	LW3-GSP09W-A-1							LW3-GSP09W-C00		MT		11	--	1						
10/17/07	13:00	LW3-GSP09W-B-6							LW3-GSP09W-C00		MT		10	--	6						
10/17/07	13:11	LW3-GSP09W-C-3							LW3-GSP09W-C00		MT		11	--	3						
10/17/07	13:38	LW3-GSP10E-A-1							LW3-GSP10E-C00		MT		13	--	1						
10/17/07	14:10	LW3-GSP10E-B-3							LW3-GSP10E-C00		MT		10	--	3						
10/17/07	14:20	LW3-GSP10E-C-1							LW3-GSP10E-C00		MT		14	--	1						
10/17/07	14:49	LW3-GCR10W-A-1							LW3-GCR10W-C10		MT		14	--	1						
10/17/07	15:00	LW3-GCR10W-B-1							LW3-GCR10W-C10		MT		10	--	1						
10/17/07	16:14	LW3-GCR10W-C-6							LW3-GCR10W-C10		MT		19	--	6						
10/18/07	9:05	LW3-GSP10W-A-1							LW3GSP10W-C20		MT		19	30	1						
10/18/07	9:24	LW3-GSP10W-B-2							LW3GSP10W-C20		MT		17	30	2						
10/18/07	9:37	LW3-GSP10W-C-2							LW3GSP10W-C20		MT		15	30	2						
10/18/07	10:58	LW3-GCRSP11E-A-5							LW3-GCRSP11E-C00		MT		12	18	5						
10/18/07	11:08	LW3-GCRSP11E-B-3							LW3-GCRSP11E-C00		MT		10	20	3						
10/18/07	11:33	LW3-GCRSP11E-C-6							LW3-GCRSP11E-C00		MT		10	28	6						
10/18/07	16:36	LW3-GSP12W-ALT-A-4							LW3-GSP12W-ALT-C00		MT		14	39	4						
10/18/07	16:54	LW3-GSP12W-ALT-B-6							LW3-GSP12W-ALT-C00		MT		13	44	6						
10/18/07	17:11	LW3-GSP12W-ALT-C-6							LW3-GSP12W-ALT-C00		MT		12	43	6						
10/18/07	14:42	LW3-GCR12W-A-1							LW3-GCR12W-C00		MT		11	17	1						
10/18/07	14:53	LW3-GCR12W-B-1							LW3-GCR12W-C00		MT		10	12	1						
10/18/07	15:15	LW3-GCR12W-C-6							LW3-GCR12W-C00		MT		12	12	6						
10/18/07	13:58	LW3-GCRSP12E-A-13							LW3-GCRSP12E-C00		MT		12	26	13						
10/18/07	13:41	LW3-GCRSP12E-B-10							LW3-GCRSP12E-C00		MT		12	15	10						
10/18/07	12:46	LW3-GCRSP12E-C-1							LW3-GCRSP12E-C00		MT		11	18	1						
11/19/07	11:33	LW3-GCA01E-1d							LW3-CA01E-C00	12/7/2007	MT	Corbicula sp.	12	--	4						

Table F-1. Round 3B Collected Fish and Invertebr:

Date	Time	Sample Code	Lab Weight (g)	Lab Total Length (mm)	Lab Fork Length (mm)	Lab Body Weight (g)	Lab Fillet Weight (g)	Comp #	Comp sample code	SentToLab	Packer	Species Name	Grab Penetration Depth (cm)	Water Depth (ft) a	Grab Number	Tow #	Tow line out (ft)	Tow Scope	Tow duration (sec)	Estimated Total biomass (g)	Total # of clams per tow
11/19/07	11:39	LW3-GCA01E-2a							LW3-CA01E-C00	12/7/2007	MT	Corbicula sp.	13	--	1						
11/19/07	11:46	LW3-GCA01E-3a							LW3-CA01E-C00	12/7/2007	MT	Corbicula sp.	13	--	1						
11/19/07	11:53	LW3-GCA01E-4a							LW3-CA01E-C00	12/7/2007	MT	Corbicula sp.	12	--	1						
11/19/07	12:00	LW3-GCA01E-5a							LW3-CA01E-C00	12/7/2007	MT	Corbicula sp.	15	--	1						
11/19/07	12:06	LW3-GCA01E-6a							LW3-CA01E-C00	12/7/2007	MT	Corbicula sp.	15	--	1						
11/19/07	9:43	LW3-GCA02W-1e							LW3-CA02W-C00	12/7/2007	MT	Corbicula sp.	13	4	5						
11/19/07	9:55	LW3-GCA02W-2a							LW3-CA02W-C00	12/7/2007	MT	Corbicula sp.	14	--	1						
11/19/07	10:02	LW3-GCA02W-3a							LW3-CA02W-C00	12/7/2007	MT	Corbicula sp.	16.5	--	1						
11/19/07	10:10	LW3-GCA02W-4a							LW3-CA02W-C00	12/7/2007	MT	Corbicula sp.	13	2.5	1						
11/19/07	10:20	LW3-GCA02w-5a							LW3-CA02W-C00	12/7/2007	MT	Corbicula sp.	12	--	1						
11/19/07	10:27	LW3-GCA02W-6a							LW3-CA02W-C00	12/7/2007	MT	Corbicula sp.	--	6.5	1						
11/21/07	10:57	LW3-GCA03W-1a							LW3-CA03W-C00	12/7/2007	MT	Corbicula sp.	15	8	1						
11/21/07	11:02	LW3-GCCA03W-2a							LW3-CA03W-C00	12/7/2007	MT	Corbicula sp.	17	15	1						
11/21/07	11:07	LW3-GCA03W-3a							LW3-CA03W-C00	12/7/2007	MT	Corbicula sp.	17	8	1						
11/21/07	11:12	LW3-GCA03W-4a							LW3-CA03W-C00	12/7/2007	MT	Corbicula sp.	17	16	1						
11/21/07	11:28	LW3-GCA03W-5c							LW3-CA03W-C00	12/7/2007	MT	Corbicula sp.	17	17	3						
11/21/07	11:38	LW3-GCA03W-6b							LW3-CA03W-C00	12/7/2007	MT	Corbicula sp.	17	17	2						
11/19/07	13:50	LW3-GCA04W-1f							LW3-CA04W-C00	12/7/2007	MT	Corbicula sp.	16	34	6						
11/19/07	14:00	LW3-GCA04W-2a							LW3-CA04W-C00	12/7/2007	MT	Corbicula sp.	12	33	1						
11/19/07	14:15	LW3-GCA04W-3c							LW3-CA04W-C00	12/7/2007	MT	Corbicula sp.	14	34	3						
11/19/07	14:22	LW3-GCA04W-4a							LW3-CA04W-C00	12/7/2007	MT	Corbicula sp.	13	8	1						
11/19/07	14:39	LW3-GCA04W-5d							LW3-CA04W-C00	12/7/2007	MT	Corbicula sp.	13	6	4						
11/19/07	14:48	LW3-GCA04W-6a							LW3-CA04W-C00	12/7/2007	MT	Corbicula sp.	16	6	1						
11/19/07	15:20	LW3-GCA05E-1a							LW3-CA05E-C00	12/7/2007	MT	Corbicula sp.	12	--	1						
11/19/07	15:27	LW3-GCA05E-2a							LW3-CA05E-C00	12/7/2007	MT	Corbicula sp.	13	21	1						
11/19/07	15:33	LW3-GCA05E-3a							LW3-CA05E-C00	12/7/2007	MT	Corbicula sp.	14	22	1						
11/19/07	15:43	LW3-GCA05E-4b							LW3-CA05E-C00	12/7/2007	MT	Corbicula sp.	14	16	2						
11/19/07	15:49	LW3-GCA05E-5a							LW3-CA05E-C00	12/7/2007	MT	Corbicula sp.	12	8	1						
11/19/07	16:18	LW3-GCA05E-6o							LW3-CA05E-C00	12/7/2007	MT	Corbicula sp.	12	15	15						
11/21/07	9:15	LW3-GCA05W-1b							LW3-CA05W-C00	12/7/2007	MT	Corbicula sp.	17	31	2						
11/21/07	9:28	LW3-GCA05W-2b							LW3-CA05W-C00	12/7/2007	MT	Corbicula sp.	17	51	2						
11/21/07	9:34	LW3-GCA05w-3a							LW3-CA05W-C00	12/7/2007	MT	Corbicula sp.	17	25	1						
11/21/07	9:47	LW3-GCA05W-4b							LW3-CA05W-C00	12/7/2007	MT	Corbicula sp.	17	48	2						
11/21/07	9:52	LW3-GCA05W-5a							LW3-CA05W-C00	12/7/2007	MT	Corbicula sp.	17	43	1						
11/21/07	10:01	LW3-GCA05W-6c							LW3-CA05W-C00	12/7/2007	MT	Corbicula sp.	12	30	3						
11/21/07	10:17	LW3-GCA05W-7e							LW3-CA05W-C00	12/7/2007	MT	Corbicula sp.	16	30	5						
11/20/07	14:10	LW3-GCA10W-1E							LW3-CA10W-C00	12/7/2007	MT	Corbicula sp.	17	48	5						
11/20/07	14:30	LW3-GCA10W-2E							LW3-CA10W-C00	12/7/2007	MT	Corbicula sp.	16	40	5						
11/20/07	14:35	LW3-GCA10W-3A							LW3-CA10W-C00	12/7/2007	MT	Corbicula sp.	12	35	1						
11/20/07	14:40	LW3-GCA10W-4A							LW3-CA10W-C00	12/7/2007	MT	Corbicula sp.	13	35	1						
11/20/07	14:46	LW3-GCA10W-5A							LW3-CA10W-C00	12/7/2007	MT	Corbicula sp.	14	30	1						
11/20/07	14:50	LW3-GCA10W-6A							LW3-CA10W-C00	12/7/2007	MT	Corbicula sp.	13	21	1						
11/20/07	14:59	LW3-GCA10W-7B							LW3-CA10W-C00	12/7/2007	MT	Corbicula sp.	14	32	2						
12/6/07	13:47	LW3-GCA11E-1-G1							LW3-CA11E-C00	12/7/2007	MT	Corbicula sp.	20	49	1						
12/6/07	14:26	LW3-GCA11E-2-G3							LW3-CA11E-C00	12/7/2007	MT	Corbicula sp.	16	49	3						
12/6/07	14:41	LW3-GCA11E-3-G1							LW3-CA11E-C00	12/7/2007	MT	Corbicula sp.	24	49	1						
12/6/07	14:56	LW3-GCA11E-4-G1							LW3-CA11E-C00	12/7/2007	MT	Corbicula sp.	20	50	1						
12/6/07	15:08	LW3-GCA11E-5-G1							LW3-CA11E-C00	12/7/2007	MT	Corbicula sp.	17	49	1						
12/6/07	16:20	LW3-GCA12E-1-G1							LW3-CA12E-C00-R	12/7/2007	MT	Corbicula sp.	28	29	1						
12/6/07	16:42	LW3-GCA12E-2-G1							LW3-CA12E-C00-R	12/7/2007	MT	Corbicula sp.	26	23	1						
12/6/07	17:45	LW3-GCA12E-3-G4							LW3-CA12E-C00-R	12/7/2007	MT	Corbicula sp.	18	--	4						
11/20/07	12:08	LW3-GCA12W-1A							LW3-CA12W-C00	12/7/2007	MT	Corbicula sp.	15	54	1						
11/20/07	12:15	LW3-GCA12W-2A							LW3-CA12W-C00	12/7/2007	MT	Corbicula sp.	14	55	1						
11/20/07	12:22	LW3-GCA12W-3A							LW3-CA12W-C00	12/7/2007	MT	Corbicula sp.	13	54	1						
11/20/07	12:29	LW3-GCA12W-4A							LW3-CA12W-C00	12/7/2007	MT	Corbicula sp.	13	53	1						
11/20/07	12:38	LW3-GCA12W-5B							LW3-CA12W-C00	12/7/2007	MT	Corbicula sp.	13	49	2						
11/20/07	13:00	LW3-GCA12W-6G							LW3-CA12W-C00	12/7/2007	MT	Corbicula sp.	14	48	7						

Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample code	LabComments
9/19/07	9:20	LW3-CP0004-08	
9/19/07	15:35	LW3-CP0004-12	
9/18/07	12:55	LW3-CP0004-06	
9/20/07	12:00	LW3-CP0004-15	Gravid.
9/18/07	10:00	LW3-CP0004-05	
9/17/07	14:50	LW3-CP0004-17	Originally labeled in duplicate as LW3-CP0004-03 by BP on 9/17/07 at 14:50
9/18/07	14:20	LW3-CP0004-07	
9/20/07	11:10	LW3-CP0004-14	Gravid. Cut into peritoneum of right side belly during filleting. Rinsed area after cutting out belly peritoneum and leaving with carcass.
9/25/07	11:55	LW3-CP0004-16	Gravid
9/19/07	13:45	LW3-CP0004-11	
9/18/07	9:10	LW3-CP0004-13	
9/14/07	12:45	LW3-CP0004-02	Originally labeled as LW3-CP0004-01 by BP on 9/14/07 at 12:45
9/19/07	13:40	LW3-CP0004-10	
9/18/07	9:15	LW3-CP0004-04	Rinsed with DI water because of blood and slime.
9/19/07	10:00	LW3-CP0004-09	
9/4/07	14:00	LW3-CP0004-01	Cut into body cavity (appeared to have eggs) but didn't release body fluids on fillet. Rinsed fillets & body w/ DI and changed to clean knife.[KW 9/5/07].
9/17/07	14:50	LW3-CP0004-03	Originally labeled in duplicate as LW3-CP0004-02 by BP on 9/17/07 at 12:40
9/12/07	17:12	LW3-CP0408-02	Gut cavity punctured-fillet rinsed with DI water
9/13/07	12:15	LW3-CP0408-07	
9/18/07	13:30	LW3-CP0408-12	
9/13/07	11:14	LW3-CP0408-05	
9/20/07	12:00	LW3-CP0408-15	Gravid. Removed hook from mouth.
9/13/07	11:45	LW3-CP0408-06	
9/14/07	11:40	LW3-CP0408-09	Gills damaged from hook removal. Alive
9/13/07	11:07	LW3-CP0408-03	
9/20/07	9:10	LW3-CP0408-13	Hook removed from mouth
9/21/07	10:33	LW3-CP0408-16	Gravid
9/17/07	14:15	LW3-CP0408-11	
9/13/07	11:12	LW3-CP0408-04	
9/14/07	10:51	LW3-CP0408-08	
9/20/07	15:35	LW3-CP0408-14	Gravid
9/21/07	10:40	LW3-CP0408-17	Gravid
9/17/07	10:50	LW3-CP0408-10	Adjusted/corrected date/time on camera. Red/torn caudal fin.
9/17/07	14:50	LW3-CP0812-01	Attempted hook removal, still in fish.
9/25/07	14:25	LW3-CP0812-10	
9/24/07	10:10	LW3-CP0812-11	Gravid
9/24/07	14:00	LW3-CP0812-12	Gravid
9/25/07	9:00	LW3-CP0812-13	
9/25/07	12:10	LW3-CP0812-14	
9/25/07	12:10	LW3-CP0812-15	
9/21/07	11:00	LW3-CP0812-02	Gravid
9/24/07	10:15	LW3-CP0812-03	
9/24/07	11:30	LW3-CP0812-04	
9/24/07	14:18	LW3-CP0812-05	Prespawn male
9/24/07	14:34	LW3-CP0812-06	Gravid
9/24/07	15:35	LW3-CP0812-07	Gravid
9/24/07	15:50	LW3-CP0812-08	Gravid
9/24/07	16:10	LW3-CP0812-09	Gravid
9/4/07	8:10	LW3-SB02E-01	undersize
9/11/07	8:25	LW3-SB02E-04	
9/4/07	10:12	LW3-SB02E-02	
9/11/07	8:42	LW3-SB02E-05	
9/7/07	9:30	LW3-SB02E-03	
9/11/07	9:27	LW3-SB02E-06	

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Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample_code	LabComments
9/7/07	10:00	LW3-SB03E-04	
9/11/07	9:46	LW3-SB03E-07	
9/7/07	10:55	LW3-SB03E-05	
9/11/07	9:44	LW3-SB03E-06	
9/4/07	11:30	LW3-SB03E-01	
9/4/07	11:30	LW3-SB03E-02	
9/4/07	11:55	LW3-SB03E-03	
9/4/07	11:54	LW3-SB03W-04	
9/4/07	11:31	LW3-SB03W-01	
9/4/07	12:05	LW3-SB03W-05	
9/4/07	11:33	LW3-SB03W-02	
9/4/07	11:52	LW3-SB03W-03	
9/11/07	10:54	LW3-SB04E-10	
9/11/07	10:25	LW3-SB04E-08	
9/10/07	14:15	LW3-SB04E-05	Parasite in left fillet
9/4/07	15:20	LW3-SB04E-04	
9/4/07	14:45	LW3-SB04E-02	
9/4/07	15:00	LW3-SB04E-03	
9/10/07	14:15	LW3-SB04E-07	Originally labeled in duplicate as LW3-SB04E-005 by IS on 9/10/07 at 14:15
9/10/07	14:45	LW3-SB04E-06	
9/11/07	10:34	LW3-SB04E-09	One parasite through body
9/4/07	14:36	LW3-SB04W-04	
9/4/07	14:20	LW3-SB04W-03	
9/4/07	15:25	LW3-SB04W-06	carcass (B) weight incorrectly logged as 288.3g
9/5/07	8:15	LW3-SB04W-07	Correctly labeled in the field at 08:15 on 9/5/07 but incorrectly labled at LW3-SB04w-02 at field lab by TP on 9/6/07
9/4/07	14:38	LW3-SB04W-05	
9/4/07	12:42	LW3-SB04W-02	
9/4/07	12:37	LW3-SB04W-01	
9/5/07	8:53	LW3-SB05W-01	
9/5/07	9:50	LW3-SB05W-06	One parasite observed in fish
9/5/07	9:16	LW3-SB05W-03	
9/5/07	10:35	LW3-SB05W-08	
9/5/07	10:08	LW3-SB05W-07	
9/5/07	9:35	LW3-SB05W-05	
9/5/07	9:14	LW3-SB05W-02	
9/5/07	9:18	LW3-SB05W-04	
9/5/07	10:36	LW3-SB05W-09	
9/5/07	10:50	LW3-SB05W-10	
9/10/07	9:52	LW3-SB06E-06	Punctured gut cavity, fillet rinsed. Did not contaminate.
9/6/07	7:40	LW3-SB06E-02	
9/10/07	10:24	LW3-SB06E-07	Parasite noted in body and fillet
9/10/07	9:50	LW3-SB06E-05	
9/5/07	9:40	LW3-SB06E-01	
9/10/07	12:32	LW3-SB06E-08	
9/5/07	11:10	LW3-SB06W-01	
9/5/07	11:28	LW3-SB06W-03	2-(15mm) parasites observed in filet
9/5/07	11:37	LW3-SB06W-04	
9/5/07	12:12	LW3-SB06W-05	
9/5/07	15:26	LW3-SB06W-09	
9/5/07	15:24	LW3-SB06W-08	
9/5/07	14:42	LW3-SB06W-06	
9/5/07	11:16	LW3-SB06W-02	
9/5/07	15:23	LW3-SB06W-07	
9/5/07	12:17	LW3-SB07E-04	

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Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample_code	LabComments
9/11/07	11:50	LW3-SB07E-07	
9/5/07	11:01	LW3-SB07E-01	
9/5/07	11:20	LW3-SB07E-03	
9/11/07	11:47	LW3-SB07E-06	
9/5/07	12:35	LW3-SB07E-05	
9/5/07	11:15	LW3-SB07E-02	
9/6/07	8:14	LW3-SB07W-02	Slightly cut into gut cavity, switched knives, rinsed fillet with DI water
9/6/07	8:28	LW3-SB07W-03	
9/6/07	8:45	LW3-SB07W-04	
9/6/07	9:30	LW3-SB07W-07	
9/6/07	8:46	LW3-SB07W-05	
9/6/07	9:12	LW3-SB07W-06	
9/6/07	9:40	LW3-SB07W-08	
9/6/07	7:27	LW3-SB07W-01	One parasite observed on fish and one in fillet.
9/5/07	14:01	LW3-SB08E-01	
9/5/07	14:45	LW3-SB08E-02	
9/5/07	15:05	LW3-SB08E-03	Parasite found on body and fillet.
9/5/07	15:05	LW3-SB08E-04	
9/5/07	15:30	LW3-SB08E-05	
9/6/07	12:45	LW3-SB08W-10	
9/10/07	9:16	LW3-SB08W-11	
9/11/07	12:34	LW3-SB08W-12	Entered gut cavity, no puncture noted, switched knives and rinsed fillets.
9/6/07	9:54	LW3-SB08W-05	Four bass were collected on set lines at SP08W and incorrectly labeled as SB08 instead of SB09. Fish were relabeled as SB09W01-04. That's why fish ID starts with fish # 5 at SB08W. Dropped whole fish on floor before filleting, rinsed thoroughly with DI.
9/6/07	10:04	LW3-SB08W-06	
9/6/07	11:20	LW3-SB08W-07	
9/6/07	11:40	LW3-SB08W-08	
9/6/07	12:25	LW3-SB08W-09	
9/6/07	10:42	LW3-SB09E-03	Punctured body cavity, no leakage onto fillet
9/6/07	11:12	LW3-SB09E-04	
9/6/07	11:24	LW3-SB09E-05	
9/6/07	9:25	LW3-SB09E-02	
9/6/07	9:10	LW3-SB09E-01	
9/11/07	14:10	LW3-SB09E-06	
9/5/07	10:30	LW3-SB09W-04	Originally caught at SP08W on 9/5/07 at 10:30 on a set line by AR and incorrectly labeled as SB08W-04
9/6/07	14:55	LW3-SB09W-05	
8/31/07	9:50	LW3-SB09W-03	Originally caught at SP08W on 8/31/07 at 09:50 on a set line by AR and incorrectly labeled as SB08W-02. Nicked belly on left fillet; kept blood from fillet and rinsed fillet and fish with DI.
9/6/07	15:48	LW3-SB09W-06	While filleting, abrasion on left side of body, noted as extending into gut cavity avoided filleting area and rinsed fillet.
8/28/07	11:40	LW3-SB09W-01	Originally caught at SP08W on 8/28/07 at 11:40 on a set line by JM and incorrectly labeled as SB08W-01. At EPA request, fish held 48 hrs prior to processing in order for them to observe.
9/11/07	13:40	LW3-SB09W-08	
8/31/07	9:50	LW3-SB09W-02	Caught at SP08W by AR and incorrectly labeled as SB08W-01. Some blood present on fish, rinsed with DI water. During fillet, blood came to surface at one point, possible small puncture. Fish rinsed with DI water.
9/6/07	15:48	LW3-SB09W-07	
9/6/07	11:55	LW3-SB10E-01	
9/6/07	13:13	LW3-SB10E-04	
9/11/07	14:35	LW3-SB10E-06	
9/11/07	15:00	LW3-SB10E-07	
9/6/07	12:50	LW3-SB10E-03	
9/6/07	13:50	LW3-SB10E-05	
9/6/07	12:06	LW3-SB10E-02	
9/7/07	11:27	LW3-SB10W-02	
9/7/07	11:30	LW3-SB10W-03	
9/10/07	8:52	LW3-SB10W-06	
9/10/07	7:35	LW3-SB10W-05	
9/14/07	8:28	LW3-SB10W-08	
9/10/07	7:30	LW3-SB10W-07	

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Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample code	LabComments
9/17/07	8:40	LW3-SB10W-09	Hook removed
9/5/07	10:20	LW3-SB10W-01	
9/7/07	7:55	LW3-SB10W-04	Correctly labeled in the field at 07:55 on 9/7/07 but incorrectly labeled as LW3-SB10W-07 at field lab by KEI on 9/7/07. It was relabeled as LW3-SB10W-04 by MT.
9/6/07	14:15	LW3-SB11E-07	Originally labeled as a duplicate to SB11E-01 caught on 9/6/07 at 14:15 by SW.
9/6/07	14:25	LW3-SB11E-08	Originally labeled as a duplicate to SB11E-02 on 9/6/07 at 14:25 by SW.
9/5/07	8:35	LW3-SB11W-12	Originally labeled SB11W-02 in the field by TD on 9/5/07 at 08:45 and then incorrectly relabeled as SB11E-02 by TP. Fish was relabeled SB11W-12 since SB11W-02 already existed.
9/6/07	15:43	LW3-SB11E-06	
9/6/07	15:25	LW3-SB11E-05	
9/6/07	15:10	LW3-SB11E-03	
9/5/07	8:35	LW3-SB11W-11	Fish caught at SB11W on 9/5/07 at 08:45 and was incorrectly labeled as SB11E-01 at the field lab by TP on 9/6/07. Relabeled as SB11W-11. Fish ended up as part of LW3-SBE11-C00 composite.
9/6/07	15:12	LW3-SB11E-04	
9/7/07	10:33	LW3-SB11W-08	
9/7/07	10:03	LW3-SB11W-05	
9/11/07	15:25	LW3-SB11W-10	
9/7/07	9:31	LW3-SB11W-04	
9/7/07	9:01	LW3-SB11W-01	
9/7/07	9:05	LW3-SB11W-03	
9/7/07	10:24	LW3-SB11W-06	One parasite near gut cavity
9/11/07	15:20	LW3-SB11W-09	
9/7/07	9:02	LW3-SB11W-02	
9/7/07	10:28	LW3-SB11W-07	
9/11/07	10:10	LW3-SP01E-dock6-01	Originally labeled as SP01E-Dock6-01 which is the alternate SP01-ALT station but caught in crayfish trap at CR01-Alt (Dock 1)
8/31/07	8:34	LW3-SP01E-01	This sample does not have "Alt" on the field sheets.
9/5/07	8:24	LW3-SP01E-02	This sample does not have "Alt" on the field sheets.
9/12/07	8:53	LW3-SP01E-03	Caught in crayfish trap at CR01E (Dock 3). This sample does not have "Alt" on the field sheets.
9/12/07	9:50	LW3-SP01E-04	
9/12/07	9:50	LW3-SP01E-05	
9/12/07	9:50	LW3-SP01E-06	
9/12/07	9:50	LW3-SP01E-07	
9/13/07	9:17	LW3-SP01E-08	
9/13/07	9:27	LW3-SP01E-09	
8/31/07	8:06	LW3-SP01W-01	
9/11/07	11:10	LW3-SP01W-02	
9/11/07	11:10	LW3-SP01W-03	
9/11/07	11:10	LW3-SP01W-04	
9/11/07	11:10	LW3-SP01W-05	
9/11/07	11:10	LW3-SP01W-06	
9/11/07	11:10	LW3-SP01W-07	
9/11/07	11:10	LW3-SP01W-08	
9/11/07	11:10	LW3-SP01W-09	
9/19/07	9:46	LW3-SP01W-10	
9/19/07	9:46	LW3-SP01W-11	
9/19/07	9:46	LW3-SP01W-12	
9/19/07	9:46	LW3-SP01W-13	Originally labeled as a duplicate to SP01W-09 by AR on 9/19/07 at 09:46.
8/31/07	10:45	LW3-SP03E-01	
9/7/07	8:31	LW3-SP03E-02	
9/7/07	8:31	LW3-SP03E-03	
9/21/07	8:59	LW3-SP03E-04	
9/26/07	9:20	LW3-SP03E-05	
9/27/07	13:33	LW3-SP03E-06	
9/27/07	14:41	LW3-SP03E-07	
9/27/07	14:53	LW3-SP03E-08	
9/5/07	12:28	LW3-SP04W-01	
9/5/07	12:28	LW3-SP04W-02	

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Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample code	LabComments
9/6/07	14:37	LW3-SP04W-03	Correctly labeled in the field on 9/7/07 at 08:24 by AR but incorrectly labeled as LW3-SP04W-03 at field lab by KEI on 9/8/07. It was relabeled as LW3-SP04W-04 by MT.
9/7/07	8:24	LW3-SP04W-04	
9/7/07	8:24	LW3-SP04W-05	
9/7/07	8:24	LW3-SP04W-06	
9/11/07	15:10	LW3-SP04W-07	
9/12/07	10:25	LW3-SP04W-08	
9/12/07	10:25	LW3-SP04W-09	
9/10/07	9:40	LW3-SP05E-01	
9/10/07	9:40	LW3-SP05E-02	
9/10/07	9:40	LW3-SP05E-03	
9/10/07	9:40	LW3-SP05E-04	
9/12/07	13:15	LW3-SP05E-05	
9/12/07	13:15	LW3-SP05E-06	
9/13/07	13:20	LW3-SP05E-07	
9/14/07	9:27	LW3-SP05E-08	
9/24/07	9:22	LW3-SP05E-09	
9/26/07	15:15	LW3-SP05E-10	
9/26/07	15:15	LW3-SP05E-11	
8/28/07	14:40	LW3-SP06W-01	
8/28/07	14:40	LW3-SP06W-02	
8/28/07	14:40	LW3-SP06W-03	
8/28/07	14:40	LW3-SP06W-04	
8/28/07	14:40	LW3-SP06W-05	
8/28/07	14:40	LW3-SP06W-06	
8/28/07	14:40	LW3-SP06W-07	
8/28/07	14:40	LW3-SP06W-08	
8/28/07	14:40	LW3-SP06W-09	
8/28/07	14:40	LW3-SP06W-10	
8/28/07	14:40	LW3-SP06W-11	
8/28/07	14:40	LW3-SP06W-12	
8/28/07	14:40	LW3-SP06W-13	
8/29/07	9:50	LW3-SP06W-14	
8/29/07	9:50	LW3-SP06W-15	
8/30/07	15:30	LW3-SP06W-16	
8/30/07	15:30	LW3-SP06W-17	
8/30/07	15:30	LW3-SP06W-18	
8/30/07	15:30	LW3-SP06W-19	
8/31/07	11:50	LW3-SP06W-20	
8/31/07	11:50	LW3-SP06W-21	
9/4/07	10:14	LW3-SP06W-22	
9/4/07	10:14	LW3-SP06W-23	
9/4/07	10:14	LW3-SP06W-24	
9/10/07	14:38	LW3-SP06W-25	
9/10/07	14:38	LW3-SP06W-26	
9/10/07	14:38	LW3-SP06W-27	
9/10/07	14:38	LW3-SP06W-28	
9/10/07	14:38	LW3-SP06W-29	
8/29/07	12:30	LW3-SP07E-01	
8/30/07	15:30	LW3-SP07E-02	
9/4/07	10:50	LW3-SP07E-03	
9/5/07	11:35	LW3-SP07E-04	
9/5/07	13:25	LW3-SP07E-05	
9/5/07	13:25	LW3-SP07E-06	
9/5/07	13:25	LW3-SP07E-07	

Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample code	LabComments
9/7/07	10:30	LW3-SP07E-08	
9/7/07	10:30	LW3-SP07E-09	
9/10/07	15:10	LW3-SP07E-10	
9/20/07	12:07	LW3-SP07E-11	
9/20/07	12:07	LW3-SP07E-12	
9/21/07	12:24	LW3-SP07E-13	
9/6/07	14:20	LW3-SP07W-01	
9/7/07	9:50	LW3-SP07W-02	
9/7/07	9:50	LW3-SP07W-03	
9/7/07	9:50	LW3-SP07W-04	
9/7/07	9:50	LW3-SP07W-05	
9/7/07	9:50	LW3-SP07W-06	
9/11/07	10:37	LW3-SP07W-07	
9/11/07	10:37	LW3-SP07W-08	
9/19/07	10:29	LW3-SP07W-09	
9/26/07	11:35	LW3-SP07W-10	
9/27/07	11:31	LW3-SP07W-11	
8/28/07	11:10	LW3-SP08E-01	
8/28/07	11:10	LW3-SP08E-02	
8/28/07	11:10	LW3-SP08E-03	
8/28/07	11:10	LW3-SP08E-04	
8/28/07	11:10	LW3-SP08E-05	
8/28/07	11:10	LW3-SP08E-06	
8/28/07	11:10	LW3-SP08E-07	
8/28/07	11:10	LW3-SP08E-08	
8/28/07	11:10	LW3-SP08E-09	
8/28/07	11:10	LW3-SP08E-10	
8/28/07	11:10	LW3-SP08E-11	
8/29/07	11:03	LW3-SP08E-12	
8/29/07	11:03	LW3-SP08E-13	
8/30/07	14:30	LW3-SP08E-14	
8/30/07	14:30	LW3-SP08E-15	
8/30/07	14:30	LW3-SP08E-16	
8/30/07	14:30	LW3-SP08E-17	
8/30/07	14:30	LW3-SP08E-18	
8/30/07	14:30	LW3-SP08E-19	
9/4/07	9:50	LW3-SP08E-20	
9/4/07	9:50	LW3-SP08E-21	
9/4/07	9:50	LW3-SP08E-22	
8/29/07	11:45	LW3-SP09W-01	Sculpin LW3-SP09W-1 collected on August 29, 2007 was incorrectly labeled as LW3-SP08W-01. This fish became part of the final LW3-SP08W-C00 composite sample (Table 3-1).
8/31/07	9:50	LW3-SP08W-02	
8/31/07	9:50	LW3-SP08W-03	
8/31/07	9:50	LW3-SP08W-04	
8/31/07	10:22	LW3-SP08W-05	Originally labeled as a duplicate SP08W-01 on 8/31/07 at 10:22 by AR.
9/11/07	10:30	LW3-SP08W-06	
9/11/07	13:40	LW3-SP08W-07	Originally labeled as a duplicate SP08W-06 on 9/11/07 at 13:40 by AR.
9/11/07	13:40	LW3-SP08W-08	
9/12/07	11:05	LW3-SP08W-09	Originally labeled as a duplicate SP08W-05 on 9/11/07 at 13:40 by AR.
9/21/07	13:58	LW3-SP08W-10	
9/13/07	10:50	LW3-SP09W-01	Originally labeled as a duplicate SP08W-07 on 9/12/07 at 11:05 by AR.
9/14/07	10:55	LW3-SP09W-02	
9/14/07	10:55	LW3-SP09W-03	
9/18/07	11:30	LW3-SP09W-04	
9/20/07	10:50	LW3-SP09W-05	

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Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample code	LabComments
9/20/07	10:50	LW3-SP09W-06	
9/21/07	11:15	LW3-SP09W-07	
9/21/07	11:15	LW3-SP09W-08	
9/25/07	11:45	LW3-SP09W-09	
9/25/07	12:00	LW3-SP09W-10	
9/18/07	10:52	LW3-SP10E-01	
9/18/07	10:52	LW3-SP10E-02	
9/18/07	10:52	LW3-SP10E-03	
9/18/07	10:52	LW3-SP10E-04	
9/18/07	10:52	LW3-SP10E-05	
9/19/07	16:02	LW3-SP10E-06	
9/19/07	16:02	LW3-SP10E-07	
9/19/07	16:02	LW3-SP10E-08	
9/19/07	16:02	LW3-SP10E-09	
9/19/07	16:02	LW3-SP10E-10	
9/19/07	16:02	LW3-SP10E-11	
9/19/07	16:02	LW3-SP10E-12	
9/12/07	9:56	LW3-SP10W-01	
9/19/07	15:07	LW3-SP10W-04	
9/20/07	9:10	LW3-SP10W-05	
9/21/07	9:45	LW3-SP10W-06	
9/21/07	10:30	LW3-SP10W-07	
9/21/07	10:30	LW3-SP10W-08	
9/21/07	10:30	LW3-SP10W-09	
9/21/07	10:30	LW3-SP10W-10	
9/21/07	10:30	LW3-SP10W-11	
9/19/07	9:38	LW3-SP10W-ALT-02	Location SP10W-Alt was abandoned in preference to location SP10W.
9/19/07	9:38	LW3-SP10W-ALT-03	Location SP10W-Alt was abandoned in preference to location SP10W.
9/14/07	11:20	LW3-SP11E-01	
9/14/07	11:20	LW3-SP11E-02	
9/14/07	11:20	LW3-SP11E-03	
9/14/07	11:20	LW3-SP11E-04	
9/19/07	14:25	LW3-SP11E-05	
9/25/07	10:54	LW3-SP11E-06	
9/25/07	14:44	LW3-SP11E-07	
9/25/07	14:44	LW3-SP11E-08	
9/25/07	14:44	LW3-SP11E-09	
9/27/07	13:57	LW3-SP11E-10	
9/27/07	13:57	LW3-SP11E-11	
9/27/07	13:35	LW3-SP11E-12	
9/5/07	9:31	LW3-SP12E-01	
9/6/07	10:25	LW3-SP12E-02	
9/6/07	10:25	LW3-SP12E-03	
9/6/07	10:25	LW3-SP12E-04	
9/6/07	10:25	LW3-SP12E-05	
9/6/07	10:25	LW3-SP12E-06	
9/6/07	10:25	LW3-SP12E-07	
9/6/07	10:25	LW3-SP12E-08	
9/6/07	10:25	LW3-SP12E-09	
9/6/07	10:25	LW3-SP12E-10	
9/6/07	10:25	LW3-SP12E-11	
9/6/07	10:25	LW3-SP12E-12	
9/14/07	9:20	LW3-SP12W-01	Location SP12W was abandoned in preference to location SP12W-Alt.
9/18/07	13:56	LW3-SP12W-ALT-02	

Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample_code	LabComments
9/18/07	13:56	LW3-SP12W-ALT-03	
9/18/07	13:56	LW3-SP12W-ALT-04	
9/18/07	13:56	LW3-SP12W-ALT-05	
9/18/07	13:56	LW3-SP12W-ALT-06	
9/18/07	13:56	LW3-SP12W-ALT-07	
9/18/07	13:56	LW3-SP12W-ALT-08	Correctly labeled in the field on 9/18/07 at 13:56 by TD but incorrectly labeled as LW3-SP12W-ALT-07 at field lab by KW on 9/19/07 at 13:45.
9/18/07	13:56	LW3-SP12W-ALT-09	
9/18/07	13:56	LW3-SP12W-ALT-10	
9/18/07	13:56	LW3-SP12W-ALT-11	
9/19/07	13:23	LW3-SP12W-ALT-12	
9/19/07	13:23	LW3-SP12W-ALT-13	
9/19/07	13:23	LW3-SP12W-ALT-14	
9/19/07	13:23	LW3-SP12W-ALT-15	
9/19/07	13:23	LW3-SP12W-ALT-16	
9/19/07	13:23	LW3-SP12W-ALT-17	
9/19/07	13:23	LW3-SP12W-ALT-18	
9/19/07	13:23	LW3-SP12W-ALT-19	
9/19/07	13:23	LW3-SP12W-ALT-20	
9/20/07	10:50	LW3-SP12W-ALT-21	
9/20/07	10:50	LW3-SP12W-ALT-22	
9/20/07	10:50	LW3-SP12W-ALT-23	
9/20/07	10:50	LW3-SP12W-ALT-24	
9/20/07	10:50	LW3-SP12W-ALT-25	
9/20/07	10:50	LW3-SP12W-ALT-26	
9/20/07	10:50	LW3-SP12W-ALT-27	
9/20/07	10:50	LW3-SP12W-ALT-28	
9/20/07	10:50	LW3-SP12W-ALT-29	
9/20/07	10:50	LW3-SP12W-ALT-30	
9/20/07	10:50	LW3-SP12W-ALT-31	
9/20/07	10:50	LW3-SP12W-ALT-32	
9/20/07	10:50	LW3-SP12W-ALT-33	
9/20/07	10:50	LW3-SP12W-ALT-34	
9/20/07	10:50	LW3-SP12W-ALT-35	
9/20/07	10:50	LW3-SP12W-ALT-36	
9/20/07	10:50	LW3-SP12W-ALT-37	
9/5/07	8:24	LW3-CR01E-1	
9/11/07	9:11	LW3-CR01E-2	
9/11/07	9:15	LW3-CR01E-3	
9/11/07	9:39	LW3-CR01E-ALT-Dock1-	Originally labeled as CR01E-dock1-06. Subsequently labeled as CR01E-dock6-06 at field lab and assigned to CR01E -archive instead of CR01E-ALT. [IS 1/21/07]
9/11/07	9:43	LW3-CR01E-ALT-Dock1-	Originally labeled as CR01E-dock1-07. Subsequently labeled as CR01E-dock6-07 at field lab and assigned to CR01E -archive instead of CR01E-ALT. [IS 1/21/07]
9/11/07	9:26	LW3-CR01E-ALT-Dock1-04	
9/11/07	9:36	LW3-CR01E-ALT-Dock1-05	
9/11/07	9:46	LW3-CR01E-ALT-Dock1-08	
9/11/07	9:50	LW3-CR01E-ALT-Dock1-09	
9/11/07	9:55	LW3-CR01E-ALT-Dock1-10	
9/11/07	10:00	LW3-CR01E-ALT-Dock1-11	
9/11/07	10:03	LW3-CR01E-ALT-Dock1-12	
8/30/07	9:29	LW3-CR01W-01	
8/30/07	9:33	LW3-CR01W-02	
8/30/07	9:33	LW3-CR01W-03	
8/30/07	9:33	LW3-CR01W-04	
8/30/07	9:33	LW3-CR01W-05	
8/31/07	8:08	LW3-CR01W-06	
8/31/07	8:08	LW3-CR01W-07	

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Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample code	LabComments
8/31/07	8:12	LW3-CR01W-08	
8/28/07	10:35	LW3-CR05W-01	
8/28/07	10:35	LW3-CR05W-02	
8/28/07	10:41	LW3-CR05W-03	
8/28/07	10:41	LW3-CR05W-04	
8/28/07	10:50	LW3-CR05W-05	
8/29/07	8:52	LW3-CR05W-06	
8/28/07	10:12	LW3-CR06W-01	
8/29/07	10:22	LW3-CR06W-02	
8/30/07	10:57	LW3-CR06W-03	
8/30/07	10:57	LW3-CR06W-04	
8/31/07	10:52	LW3-CR06W-05	
9/5/07	11:26	LW3-CR06W-06	
9/5/07	11:26	LW3-CR06W-07	
9/6/07	8:44	LW3-CR06W-08	
9/6/07	8:48	LW3-CR06W-09	
8/28/07	9:42	LW3-CR08W-01	
9/5/07	11:02	LW3-CR08W-02	
9/5/07	11:02	LW3-CR08W-03	
9/7/07	8:21	LW3-CR08W-04	
9/14/07	10:05	LW3-CR08W-05	
9/14/07	10:14	LW3-CR08W-06	
9/14/07	10:25	LW3-CR08W-07	
9/18/07	10:30	LW3-CR08W-08	
9/25/07	8:38	LW3-CR08W-09	
9/25/07	8:38	LW3-CR08W-10	
8/28/07	9:12	LW3-CR10W-01	
8/28/07	9:12	LW3-CR10W-02	
8/28/07	9:12	LW3-CR10W-03	
8/29/07	9:35	LW3-CR10W-04	
8/29/07	9:35	LW3-CR10W-05	
8/30/07	12:44	LW3-CR10W-06	
8/30/07	12:52	LW3-CR10W-07	
8/30/07	12:52	LW3-CR10W-08	
8/30/07	12:52	LW3-CR10W-09	
8/31/07	10:01	LW3-CR11E-01	
9/5/07	10:33	LW3-CR11E-02	
9/5/07	10:33	LW3-CR11E-03	
9/5/07	10:33	LW3-CR11E-04	
9/5/07	10:33	LW3-CR11E-05	
9/5/07	10:45	LW3-CR11E-06	
9/6/07	10:08	LW3-CR11E-07	
9/6/07	10:13	LW3-CR11E-08	
8/31/07	9:15	LW3-CR12E-01	
8/31/07	9:15	LW3-CR12E-02	
9/5/07	9:25	LW3-CR12E-03	
9/5/07	9:25	LW3-CR12E-04	
9/5/07	9:25	LW3-CR12E-05	
9/5/07	9:50	LW3-CR12E-06	
9/5/07	9:50	LW3-CR12E-07	
9/5/07	9:56	LW3-CR12E-08	
8/31/07	9:31	LW3-CR12W-01	
8/31/07	9:31	LW3-CR12W-02	
8/31/07	9:38	LW3-CR12W-03	

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Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample_code	LabComments
8/31/07	9:38	LW3-CR12W-04	
8/31/07	9:42	LW3-CR12W-05	
8/31/07	9:42	LW3-CR12W-06	
9/5/07	10:08	LW3-CR12W-07	
9/5/07	10:11	LW3-CR12W-08	
9/5/07	10:17	LW3-CR12W-09	
9/5/07	10:17	LW3-CR12W-10	
9/28/07	14:00	LW3-CRBAIT-SMELT	
9/28/07	14:00	LW3-CRBAIT-SHAD	
9/28/07	14:00	LW3-SPBAIT-WORM	
9/28/07	14:00	LW3-CPBAIT-CORN	
10/15/07	13:12	LW3-GCR01E-ALT-A-1	
10/15/07	13:28	LW3-GCR01E-ALT-B-1	
10/15/07	13:40	LW3-GCR01E-ALT-C-1	
10/15/07	14:04	LW3-GSP01E-A-1	
10/15/07	14:24	LW3-GSP01E-B-1	
10/15/07	14:36	LW3-GSP01E-C-1	
10/16/07	8:57	LW3-GCRSP01W-A-4	
10/16/07	9:16	LW3-GCRSP01W-B-2	
10/16/07	9:32	LW3-GCRSP01W-C-2	
10/16/07	10:25	LW3-GSP03E-A-5	
10/16/07	10:40	LW3-GSP03E-B-1	
10/16/07	10:54	LW3-GSP03E-C-1	
10/16/07	12:26	LW3-GSP04W-A-1	
10/16/07	12:13	LW3-GSP04W-B-2	
10/16/07	11:48	LW3-GSP04W-C-2	
10/16/07	14:35	LW3-GSP05E-A-2	
10/16/07	14:52	LW3-GSP05E-B-2	
10/16/07	14:40	LW3-GSP05E-C-10	
10/16/07	13:37	LW3-GCR05W-A-1	
10/16/07	13:52	LW3-GCR05W-B-1	
10/16/07	14:09	LW3-GCR05W-C-2	
10/17/07	9:20	LW3-GCRSP06W-A-1	
10/17/07	9:50	LW3-GCRSP06W-B-1	
10/17/07	10:05	LW3-GCRSP06W-C-1	
10/17/07	10:32	LW3-GSP07E-A-3	
10/17/07	10:57	LW3-GSP07E-B-3	
10/17/07	11:12	LW3-GSP07E-C-2	
10/15/07	15:36	LW3-GSP07W-A-1	
10/15/07	15:56	LW3-GSP07W-B-1	
10/15/07	16:19	LW3-GSP07W-C-1	
10/15/07	9:30	LW3-GSP08E-A-1	
10/15/07	10:23	LW3-GSP08E-B-4	
10/15/07	9:47	LW3-GSP08E-C-1	
10/15/07	10:57	LW3-GCRSP08W-A-1	
10/15/07	11:24	LW3-GCRSP08W-B-1	
10/15/07	12:00	LW3-GCRSP08W-C-1	
10/17/07	12:15	LW3-GSP09W-A-1	
10/17/07	13:00	LW3-GSP09W-B-6	
10/17/07	13:11	LW3-GSP09W-C-3	
10/17/07	13:38	LW3-GSP10E-A-1	
10/17/07	14:10	LW3-GSP10E-B-3	
10/17/07	14:20	LW3-GSP10E-C-1	
10/17/07	14:49	LW3-GCR10W-A-1	

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Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample_code	LabComments
10/17/07	15:00	LW3-GCR10W-B-1	
10/17/07	16:14	LW3-GCR10W-C-6	
10/18/07	9:05	LW3-GSP10W-A-1	
10/18/07	9:24	LW3-GSP10W-B-2	
10/18/07	9:37	LW3-GSP10W-C-2	
10/18/07	10:58	LW3-GCRSP11E-A-5	
10/18/07	11:08	LW3-GCRSP11E-B-3	
10/18/07	11:33	LW3-GCRSP11E-C-6	
10/18/07	16:36	LW3-GSP12W-ALT-A-4	
10/18/07	16:54	LW3-GSP12W-ALT-B-6	
10/18/07	17:11	LW3-GSP12W-ALT-C-6	
10/18/07	14:42	LW3-GCR12W-A-1	
10/18/07	14:53	LW3-GCR12W-B-1	
10/18/07	15:15	LW3-GCR12W-C-6	
10/18/07	13:58	LW3-GCRSP12E-A-13	
10/18/07	13:41	LW3-GCRSP12E-B-10	
10/18/07	12:46	LW3-GCRSP12E-C-1	
11/14/07	12:07	LW3-CA01E-01	
11/14/07	12:16	LW3-CA01E-02	
11/14/07	12:25	LW3-CA01E-03	
11/14/07	12:32	LW3-CA01E-04	
11/14/07	12:43	LW3-CA01E-05	
11/14/07	12:51	LW3-CA01E-06	
11/14/07	12:58	LW3-CA01E-07	
11/14/07	13:06	LW3-CA01E-08	
11/14/07	13:15	LW3-CA01E-09	The boat trailed off the path near end of tow, due to sledge acting as an anchor.
11/14/07	13:25	LW3-CA01E-10	The boat trailed off the path near end of tow, due to sledge acting as an anchor.
11/14/07	13:34	LW3-CA01E-11	The boat trailed off the path near end of tow, due to sledge acting as an anchor.
11/14/07	13:41	LW3-CA01E-12	
11/14/07	14:00	LW3-CA01E-13	
11/14/07	14:10	LW3-CA01E-14	
11/14/07	14:15	LW3-CA01E-15	
11/14/07	8:29	LW3-CA02W-01	
11/14/07	8:38	LW3-CA02W-02	
11/14/07	8:46	LW3-CA02W-03	
11/14/07	8:54	LW3-CA02W-04	
11/14/07	9:04	LW3-CA02W-05	
11/14/07	9:10	LW3-CA02W-06	snagged on bottom.
11/14/07	9:17	LW3-CA02W-07	no sample from tow
11/14/07	9:25	LW3-CA02W-08	the boat moved off course near end of tow but sampler still went straight along tow path
11/14/07	9:34	LW3-CA02W-09	
11/14/07	9:51	LW3-CA02W-10	
11/14/07	9:59	LW3-CA02W-11	
11/14/07	10:07	LW3-CA02W-12	
11/14/07	10:17	LW3-CA02W-13	
11/14/07	10:25	LW3-CA02W-14	
11/14/07	10:32	LW3-CA02W-15	no sample from tow
11/14/07	10:36	LW3-CA02W-16	
11/13/07	15:24	LW3-CA03W-01	
11/13/07	15:31	LW3-CA03W-02	
11/13/07	15:41	LW3-CA03W-03	
11/13/07	15:52	LW3-CA03W-04	Sampler snaged on something.
11/13/07	16:01	LW3-CA03W-05	no sample from tow
11/13/07	16:13	LW3-CA03W-06	

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Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample code	LabComments
11/13/07	16:20	LW3-CA03W-07	
11/13/07	16:29	LW3-CA03W-08	
11/13/07	16:36	LW3-CA03W-09	
11/13/07	16:44	LW3-CA03W-10	
11/13/07	16:54	LW3-CA03W-11	
11/13/07	17:06	LW3-CA03W-12	
11/14/07	7:42	LW3-CA03W-13	no sample from tow
11/14/07	7:50	LW3-CA03W-14	no sample from tow
11/14/07	7:57	LW3-CA03W-15	
11/16/07	16:08	LW3-CA03W-16	
11/16/07	16:16	LW3-CA03W-17	
11/16/07	16:22	LW3-CA03W-18	
11/13/07	12:29	LW3-CA04W-01	no sample from tow
11/13/07	12:34	LW3-CA04W-02	
11/13/07	12:47	LW3-CA04W-03	
11/13/07	12:58	LW3-CA04W-04	
11/13/07	13:09	LW3-CA04W-05	no sample from tow
11/13/07	13:19	LW3-CA04W-06	
11/13/07	13:30	LW3-CA04W-07	no sample from tow
11/13/07	13:35	LW3-CA04W-08	no sample from tow
11/13/07	13:53	LW3-CA04W-09	
11/13/07	14:02	LW3-CA04W-10	no sample from tow
11/13/07	14:20	LW3-CA04W-11	
11/13/07	14:30	LW3-CA04W-12	
11/13/07	14:37	LW3-CA04W-13	no sample from tow
11/13/07	14:45	LW3-CA04W-14	no sample from tow
11/13/07	14:54	LW3-CA04W-15	
11/13/07	15:01	LW3-CA04W-16	
11/14/07	15:32	LW3-CA05E-01	
11/14/07	15:41	LW3-CA05E-02	
11/14/07	15:51	LW3-CA05E-03	
11/14/07	15:59	LW3-CA05E-04	
11/14/07	16:09	LW3-CA05E-05	no sample from tow
11/14/07	16:18	LW3-CA05E-06	
11/14/07	16:25	LW3-CA05E-07	
11/14/07	16:33	LW3-CA05E-08	
11/14/07	16:39	LW3-CA05E-09	
11/14/07	16:51	LW3-CA05E-10	
11/15/07	16:06	LW3-CA05E-11	
11/15/07	16:12	LW3-CA05E-12	
11/15/07	16:20	LW3-CA05E-13	
11/15/07	16:26	LW3-CA05E-14	
11/15/07	16:36	LW3-CA05E-15	
11/12/07	8:57	LW3-CA05W-01	
11/12/07	9:14	LW3-CA05W-02	
11/12/07	9:28	LW3-CA05W-03	Sampler Lost, on bottom of river
11/13/07	8:08	LW3-CA05W-04	
11/13/07	8:23	LW3-CA05W-05	no sample from tow
11/13/07	8:32	LW3-CA05W-06a	no sample from tow
11/13/07	8:53	LW3-CA05W-07	
11/13/07	9:05	LW3-CA05W-08	
11/13/07	9:16	LW3-CA05W-09	no sample from tow
11/13/07	9:26	LW3-CA05W-10	no sample from tow
11/13/07	9:28	LW3-CA05W-11	no sample from tow

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Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample code	LabComments
11/13/07	9:47	LW3-CA05W-12	
11/13/07	9:55	LW3-CA05W-13	
11/13/07	11:28	LW3-CA05W-14	no sample from tow
11/13/07	11:39	LW3-CA05W-15	
11/13/07	11:49	LW3-CA05W-16	no sample from tow
11/13/07	11:59	LW3-CA05W-17	
11/16/07	15:00	LW3-CA05W-18	no sample from tow
11/16/07	15:09	LW3-CA05W-19	
11/16/07	15:15	LW3-CA05W-20	no sample from tow
11/16/07	15:20	LW3-CA05W-21	
11/16/07	15:27	LW3-CA05W-22	no sample from tow
11/16/07	15:33	LW3-CA05W-23	
11/16/07	15:40	LW3-CA05W-24	
11/16/07	12:19	LW3-CA10W-01	
11/16/07	12:24	LW3-CA10W-02	
11/16/07	12:36	LW3-CA10W-03	
11/16/07	12:44	LW3-CA10W-04	
11/16/07	12:52	LW3-CA10W-05	
11/16/07	13:03	LW3-CA10W-06	
11/16/07	13:14	LW3-CA10W-07	no sample from tow
11/16/07	13:19	LW3-CA10W-08	
11/16/07	13:27	LW3-CA10W-09	GPS recorded recorded as 05W-09, altered in edited shapefile.
11/16/07	13:34	LW3-CA10W-10	
11/16/07	13:42	LW3-CA10W-11	
11/16/07	13:49	LW3-CA10W-12	
11/16/07	13:59	LW3-CA10W-13	
11/16/07	14:07	LW3-CA10W-14	
11/16/07	14:14	LW3-CA10W-15	
11/16/07	14:23	LW3-CA10W-16	
11/15/07	8:11	LW3-CA11E-01	
11/15/07	8:22	LW3-CA11E-02	
11/15/07	8:31	LW3-CA11E-03	
11/15/07	8:38	LW3-CA11E-04	
11/15/07	8:48	LW3-CA11E-05	
11/15/07	8:56	LW3-CA11E-06	
11/15/07	9:04	LW3-CA11E-07	
11/15/07	9:13	LW3-CA11E-08	no sample from tow
11/15/07	9:19	LW3-CA11E-09	
11/15/07	9:27	LW3-CA11E-10	
11/15/07	9:54	LW3-CA11E-11	max line out is 188 ft.
11/15/07	12:02	LW3-CA12E-01	no sample from tow
11/15/07	12:10	LW3-CA12E-02	
11/15/07	12:20	LW3-CA12E-03	no sample from tow
11/15/07	12:36	LW3-CA12E-04	
11/15/07	12:49	LW3-CA12E-05	
11/15/07	12:58	LW3-CA12E-06	no sample from tow
11/15/07	13:05	LW3-CA12E-07	no sample from tow
11/15/07	13:09	LW3-CA12E-08	no sample from tow
11/15/07	13:15	LW3-CA12E-09	no sample from tow
11/15/07	13:27	LW3-CA12E-10	
11/15/07	13:36	LW3-CA12E-11	no sample from tow
11/15/07	13:45	LW3-CA12E-12	no sample from tow
11/15/07	13:50	LW3-CA12E-13	
11/15/07	14:02	LW3-CA12E-14	

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Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample code	LabComments
11/15/07	14:16	LW3-CA12E-15	
11/15/07	14:55	LW3-CA12E-16	
11/15/07	15:04	LW3-CA12E-17	
11/15/07	15:13	LW3-CA12E-18	
11/15/07	15:22	LW3-CA12E-19	
11/15/07	10:47	LW3-CA12W-01	
11/15/07	11:09	LW3-CA12W-02	max line out is 188 ft.
11/16/07	8:12	LW3-CA12W-03	Total biomass for 12W does not include clam from tow 1
11/16/07	8:17	LW3-CA12W-04	no sample from tow
11/16/07	8:26	LW3-CA12W-05	no sample from tow
11/16/07	8:31	LW3-CA12W-06	no sample from tow
11/16/07	8:40	LW3-CA12W-07	no sample from tow
11/16/07	8:46	LW3-CA12W-08	no sample from tow
11/16/07	8:49	LW3-CA12W-09	no sample from tow
11/16/07	8:56	LW3-CA12W-10	no sample from tow
11/16/07	9:03	LW3-CA12W-11	no sample from tow
11/16/07	9:07	LW3-CA12W-12	no sample from tow
11/16/07	9:33	LW3-CA12W-13	185 ft is max amt of line we can let out
11/16/07	9:44	LW3-CA12W-14	
11/16/07	10:01	LW3-CA12W-15	
11/16/07	10:08	LW3-CA12W-16	
11/16/07	10:14	LW3-CA12W-17	
11/16/07	10:22	LW3-CA12W-18	
11/16/07	10:31	LW3-CA12W-19	no sample from tow
11/16/07	10:38	LW3-CA12W-20	no sample from tow
11/16/07	10:43	LW3-CA12W-21	
11/16/07	10:51	LW3-CA12W-22	
11/16/07	11:00	LW3-CA12W-23	
11/16/07	11:08	LW3-CA12W-24	no sample
11/16/07	11:13	LW3-CA12W-25	
11/16/07	11:23	LW3-CA12W-26	
11/16/07	11:31	LW3-CA12W-27	
11/16/07	11:36	LW3-CA12W-28	no sample from tow
11/16/07	11:42	LW3-CA12W-29	no sample from tow
11/14/07	14:40	LW3-CA01E-C00	
11/14/07	14:40	LW3-CA01E-C00D	
11/14/07	12:05	LW3-CA02W-C00	
11/14/07	12:10	LW3-CA02W-C00D	
11/13/07	15:30	LW3-CA03W-C00	
11/13/07	12:40	LW3-CA04W-C00	
11/14/07	15:35	LW3-CA05E-C00	
11/12/07	9:05	LW3-CA05W-C00	
11/16/07	12:25	LW3-CA10W-C00	
11/16/07	12:25	LW3-CA10W-C00D	
11/15/07	8:16	LW3-CA11E-C00	
11/15/07	8:16	LW3-CA11E-C00D	
11/15/07	12:15	LW3-CA12E-C00	
11/15/07	12:15	LW3-CA12E-C00D	
11/16/07	9:40	LW3-CA12W-C00	
11/19/07	11:33	LW3-GCA01E-1d	
11/19/07	11:39	LW3-GCA01E-2a	
11/19/07	11:46	LW3-GCA01E-3a	
11/19/07	11:53	LW3-GCA01E-4a	
11/19/07	12:00	LW3-GCA01E-5a	

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Table F-1. Comments - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Date	Time	sample_code	LabComments
11/19/07	12:06	LW3-GCA01E-6a	
11/19/07	9:43	LW3-GCA02W-1e	
11/19/07	9:55	LW3-GCA02W-2a	
11/19/07	10:02	LW3-GCA02W-3a	
11/19/07	10:10	LW3-GCA02W-4a	
11/19/07	10:20	LW3-GCA02w-5a	
11/19/07	10:27	LW3-GCA02W-6a	
11/21/07	10:57	LW3-GCA03W-1a	
11/21/07	11:02	LW3-GCCA03W-2a	
11/21/07	11:07	LW3-GCA03W-3a	
11/21/07	11:12	LW3-GCA03W-4a	was originally labeled as 3W-3a, input error on boat
11/21/07	11:28	LW3-GCA03W-5c	
11/21/07	11:38	LW3-GCA03W-6b	
11/19/07	13:50	LW3-GCA04W-1f	
11/19/07	14:00	LW3-GCA04W-2a	
11/19/07	14:15	LW3-GCA04W-3c	
11/19/07	14:22	LW3-GCA04W-4a	
11/19/07	14:39	LW3-GCA04W-5d	
11/19/07	14:48	LW3-GCA04W-6a	
11/19/07	15:20	LW3-GCA05E-1a	
11/19/07	15:27	LW3-GCA05E-2a	
11/19/07	15:33	LW3-GCA05E-3a	
11/19/07	15:43	LW3-GCA05E-4b	
11/19/07	15:49	LW3-GCA05E-5a	
11/19/07	16:18	LW3-GCA05E-6o	
11/21/07	9:15	LW3-GCA05W-1b	
11/21/07	9:28	LW3-GCA05W-2b	
11/21/07	9:34	LW3-GCA05w-3a	
11/21/07	9:47	LW3-GCA05W-4b	
11/21/07	9:52	LW3-GCA05W-5a	
11/21/07	10:01	LW3-GCA05W-6c	
11/21/07	10:17	LW3-GCA05W-7e	Removed 7d from table. Should be rejected. Field note book indicates 7e accepted, table entry error as 7d
11/20/07	14:10	LW3-GCA10W-1E	
11/20/07	14:30	LW3-GCA10W-2E	
11/20/07	14:35	LW3-GCA10W-3A	
11/20/07	14:40	LW3-GCA10W-4A	
11/20/07	14:46	LW3-GCA10W-5A	
11/20/07	14:50	LW3-GCA10W-6A	
11/20/07	14:59	LW3-GCA10W-7B	
12/6/07	13:47	LW3-GCA11E-1-G1	Second set of samples collected at this station. Composite ID being renamed at lab.
12/6/07	14:26	LW3-GCA11E-2-G3	
12/6/07	14:41	LW3-GCA11E-3-G1	
12/6/07	14:56	LW3-GCA11E-4-G1	
12/6/07	15:08	LW3-GCA11E-5-G1	
12/6/07	16:20	LW3-GCA12E-1-G1	
12/6/07	16:42	LW3-GCA12E-2-G1	
12/6/07	17:45	LW3-GCA12E-3-G4	Second set of samples collected at this station. Composite ID being renamed at lab.
11/20/07	12:08	LW3-GCA12W-1A	
11/20/07	12:15	LW3-GCA12W-2A	
11/20/07	12:22	LW3-GCA12W-3A	
11/20/07	12:29	LW3-GCA12W-4A	
11/20/07	12:38	LW3-GCA12W-5B	
11/20/07	13:00	LW3-GCA12W-6G	

Table F-1. Notes - Round 3B Collected Fish and Invertebrates Tissue and Collocated Sediment Samples

Header	Description
Date	Date collected
Time	Time fish/invertebrate was collected
Coord_type	Code for coordinate type, ORNZ83FT = Oregon north zone, NAD 83, feet
Y_Northing	State Plane Coordinates
X_Easting	State Plane Coordinates
Key_Day	Fishing method acronym
Site_Round	Round 3 for LWG = LW3
Station	Sampling station identification code
Matrix	Type of sample matrix
Species	Acronym of common species name collected
Tissue	whole body or fillet
Sample	Individual sample number for each specimen collected at a specific sampling station
Sampler	Initials of field sampling staff responsible for sample collection
FieldWt_g	Field measured weight in grams of whole body fish
FieldTLgth_mm	Field measured total length in millimeters
FieldFLgth_mm	Field measured fork length in millimeters
FieldCmnts	Field comments
Method	Sampling method
LabWt_g	Lab measured weight in grams of whole body fish
LabTLgth_mm	Lab measured total length in millimeters
LabFLgth_mm	Lab measured fork length in millimeters
LabBWt_g	Lab measured body carcass after fillet removal in grams
LabFWt_g	Lab measured fillet in grams
LabCmnts	Lab comments
Comp	Indicates which fish to composite together
SentToLab	Date the composite was sent to the lab
Packer	Persons who composited and sent composite sample to lab
sample_code	Full sample code on fish's label
Species Name	Scientific name of specimen collected
Grab Penetration Depth (cm)	Penetration of grab into the sediment either with a van Veen grab or hydraulic power grab
Water Depth (ft)	Depth of water column when sample was collected
Grab Number	Number of attempts to collect sediment grabs
Tow #	Number of attempts to collect clams using a benthic sledge
Tow line out (ft)	Length of towing cable let out before locking winch and towing benthic sledge
Tow Scope	Approximate angle of inclination of tow line for benthic sledge
Tow duration (sec)	Duration of benthic sledge tows
Estimated Total biomass (g)	Estimated biomass of clams by measuring their lengths and applying to an equation (see FSP).
Total # of clams per tow	Number of clams collected per individual benthic sledge tow
na	tow coordinates for clam sampling are stored in original format and do not configure to simple lat/long configuration. Coordinates on file at Integral's Portland office.

DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.



Appendix G



PORTLAND HARBOR RI/FS

**ROUND 3B FISH AND INVERTEBRATE TISSUE
AND COLLOCATED SURFACE SEDIMENT
FIELD SAMPLING REPORT**

APPENDIX G
FISHING PERMITS

DRAFT

DO NOT QUOTE OR CITE

This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

February 15, 2008

Prepared for
The Lower Willamette Group

Prepared by
Integral Consulting Inc.
Windward Environmental LLC



Oregon

Theodore R. Kulongoski, Governor

Department of Fish and Wildlife

Fish Division
3406 Cherry Avenue NE
Salem, OR 97303
(503) 947-6201
FAX (503) 947-6202
TTY (503) 947-6339
www.dfw.state.or.us

SCIENTIFIC TAKING PERMIT - FISH



PERMITTEE: **Laurel Brown**
ORGANIZATION: **Ellis Ecological Services, Inc.**

PERMIT NUMBER: **OR2007-4082M1 partial**
PROJECT TITLE: **Round 3B fish and shellfish sampling for the RI/FS Portland Harbor Superfund Site.**

ADDRESS: **20988 S. Springwater Rd.
Estacada, OR 97023**

DATES: **8/9/2007 through 12/31/2007**

PHONE: **503-631-7809**

E-MAIL: **laurel.brown1@gmail.com**

FEDERAL AUTHORIZATION: **NMFS 4d authorization letter dated 5/23/2007, expires 12/31/2007**

NAME OF PROJECT LEADER:
Robert H. Ellis, Ph.D.

NAME OF COLLECTOR:
Laurel Brown, David DeKrey, Thai Do, Douglas Dysart, Robert H. Ellis, Ph.D., Kim Gould, Peter Kaczynski, Lisa Marco, Steve Novotny, Angelita Rodriguez, Beluse Schonek, Ian Stupakoff, Stefan Wodzicki, Jenifer Schmitz, Brian Pointer, Joss Moore, Jane Sund, Jane Sexton, Jonathan Reeve, Matt Luxon, Joanna Florer

SIGNATURE: _____ SIGNATURE: _____

TYPE OF PERMIT: **Individual**

RENEWABLE: **YES** MAY COPY? **YES**

LOCATION WHERE COLLECTION ACTIVITY IS AUTHORIZED:

Lower Willamette (Scappoose) HUC: Lower Willamette River - Sampling efforts will occur at EPA designated sites within the lower Willamette River from RM 0.5 to RM 12.0.

CONDITIONS AND AUTHORIZATION OF THIS PERMIT:

1. General conditions of Oregon Revised Statutes and Oregon Administrative Rules apply to this permit that cannot be used in lieu of any permit required by federal law or regulation. Permission to sample in areas where federally protected fish may occur is contingent upon the permittee obtaining necessary authorization from the appropriate federal agency and acting in accordance with the conditions established by the federal government.
2. This permit is not transferable from one company or person to another and must be carried on person while collecting.
3. Access to private property is contingent on the permission of the landowner. This permit does not authorize trespassing.
4. This permit is not valid in any refuge, park, city, wildlife area, or area closed to collection without written approval of manager or administrator.
5. Local officials of the Department of Fish and Wildlife and Oregon State Police must be notified prior to each sampling effort.

6. An annual activity/collection report associated with this permit must be submitted to ODFW by 31 December 2007, using the on line application process available at <http://fishresearch.nwr.noaa.gov/>. Renewal of this permit is subject to receipt by ODFW of the annual activity/collection report either prior to or in conjunction with the renewal application.
7. No protected species may be taken unless specifically listed below and any other necessary federal authorizations have been granted. See ODFW Sport Fishing Regulations for listing of species, or contact ODFW directly.
8. All numbers of fish authorized in this permit are annual totals.
9. Persons named above as "Collectors" must sign their own copy of the permit and carry the signed copy while engaged in the activities authorized in this permit.
10. Persons not named above may assist in collecting only while accompanied by project leader(s) or authorized collector(s) listed above.
11. Additional conditions and authorization:
 - a) May collect and sacrifice (take) up to 136 smallmouth bass, 50 common carp, and 374 prickly sculpin. Fish should be euthanized quickly (i.e. using a lethal dose of anesthetic).
 - b) May capture, examine, and release (take) fish as described in Table 1. Upon recovery, all fish should be released as soon as possible at or near the site of capture unless otherwise directed by the ODFW biologist. All fish handled must be reported in the annual report for this project.
 - c) Fish may be taken by backpack electrofishing, longline/setline, and hook and line/angling. Electrofishing protocols should follow the guidelines established by the National Marine Fisheries Service (NMFS) in June 2000. Members of the Oregon Bass and Panfish Club may assist collectors named on page 1 but may not collect fish for this project on their own.
 - d) Baited setlines should be used with caution. Set time should be restricted to no longer than 2 hours. After 8 hours of collection (4 2-hour sets), review catch with ODFW biologists before proceeding (971-673-6011 or 971-673-6013).
 - e) Activities must be coordinated with local ODFW Fish Biologist, Todd Alsbury, *prior to any sampling*.
 - f) Indirect mortality may not exceed 5% (electrofishing) or 1% (other methods) of the total take for any species at any site. In the event that mortality for any species exceeds this rate, the permittee should contact the Endangered Species Act Program Specialist, ODFW, (503/947-6254) prior to any further activity.
 - g) Follow FDA approved protocols and use only FDA approved substances for anesthetizing fish.
 - h) If sampling in multiple sub-basins (4th field HUCs), boots and sampling equipment intended for use in the water will be disinfected and air-dried prior to use in each location. Water containing chemicals used in handling fish and used for disinfecting equipment must not be allowed to enter waters of the state. Dispose of on dry land or allow to evaporate.
 - i) This permit only grants authority to conduct this activity under state law. Obtaining appropriate federal clearance under the Endangered Species Act is the permittee's responsibility. Terms and conditions in Attachment 1 must be adhered to for species covered under NMFS 4(d) authorization. If a condition on this permit conflicts with a condition on the federal permit or authorization, then the permittee must comply with the more restrictive condition.
 - j) Unless otherwise stated in this permit, all authorized take is only for the species, purposes and by the protocols described in the permit application. If you approach or meet your permitted take at a location and still have sampling to do, please contact the ODFW ESA Coordinator as soon as possible.

ISSUED BY:



DATE: September 26, 2007

Shelly A. Miller
Endangered Species Act Program Specialist

Distribution: G. Rule- NOAA-Fisheries, T. Alsbury, D. Ehlers - ODFW

Table 1: Species and numbers that may be capture, handled, and released (taken)

Species	Listing Unit	Production	Life Stage	Capture Method	Authorized Take
Bass, Largemouth	N/A	Natural	Adult	Electrofishing, Backpack	2
Bass, Largemouth	N/A	Natural	Adult	Hook and line/angler/rod and reel	30
Bass, Largemouth	N/A	Natural	Adult	Longline	15
Bass, Largemouth	N/A	Natural	Juvenile	Electrofishing, Backpack	25
Bass, Largemouth	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	20
Bass, Largemouth	N/A	Natural	Juvenile	Longline	20
Bass, Smallmouth	N/A	Natural	Adult	Electrofishing, Backpack	3
Bass, Smallmouth	N/A	Natural	Adult	Hook and line/angler/rod and reel	70
Bass, Smallmouth	N/A	Natural	Adult	Longline	3
Bass, Smallmouth	N/A	Natural	Juvenile	Electrofishing, Backpack	250
Bass, Smallmouth	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	560
Bass, Smallmouth	N/A	Natural	Juvenile	Longline	15
Bluegill	N/A	Natural	Adult	Electrofishing, Backpack	20
Bluegill	N/A	Natural	Adult	Hook and line/angler/rod and reel	25
Bluegill	N/A	Natural	Adult	Longline	35
Bluegill	N/A	Natural	Juvenile	Electrofishing, Backpack	50
Bluegill	N/A	Natural	Juvenile	Longline	25
Bullhead, Brown	N/A	Natural	Adult	Electrofishing, Backpack	5
Bullhead, Brown	N/A	Natural	Adult	Hook and line/angler/rod and reel	10
Bullhead, Brown	N/A	Natural	Adult	Longline	20
Bullhead, Brown	N/A	Natural	Juvenile	Electrofishing, Backpack	10
Bullhead, Brown	N/A	Natural	Juvenile	Longline	15
Carp, Common	N/A	Natural	Adult	Hook and line/angler/rod and reel	5
Carp, Common	N/A	Natural	Adult	Longline	2
Carp, Common	N/A	Natural	Juvenile	Electrofishing, Backpack	20
Carp, Common	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	5
Carp, Common	N/A	Natural	Juvenile	Longline	10
Chub, Chiselmouth	N/A	Natural	Adult	Electrofishing, Backpack	5
Chub, Chiselmouth	N/A	Natural	Adult	Longline	10

Species	Listing Unit	Production	Life Stage	Capture Method	Authorized Take
Chub, Chiselmouth	N/A	Natural	Juvenile	Electrofishing, Backpack	10
Chub, Chiselmouth	N/A	Natural	Juvenile	Longline	5
Crappie, Black	N/A	Natural	Adult	Electrofishing, Backpack	20
Crappie, Black	N/A	Natural	Adult	Hook and line/angler/rod and reel	15
Crappie, Black	N/A	Natural	Adult	Longline	20
Crappie, Black	N/A	Natural	Juvenile	Electrofishing, Backpack	50
Crappie, Black	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	20
Crappie, Black	N/A	Natural	Juvenile	Longline	20
Crappie, White	N/A	Natural	Adult	Hook and line/angler/rod and reel	10
Crappie, White	N/A	Natural	Adult	Longline	10
Crappie, White	N/A	Natural	Juvenile	Electrofishing, Backpack	20
Crappie, White	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	5
Crappie, White	N/A	Natural	Juvenile	Longline	10
Kilifish, Banded	N/A	Natural	Adult	Electrofishing, Backpack	30
Kilifish, Banded	N/A	Natural	Juvenile	Electrofishing, Backpack	50
Lamprey, Pacific	N/A	Natural	Juvenile	Electrofishing, Backpack	4
Peamouth	N/A	Natural	Adult	Electrofishing, Backpack	5
Peamouth	N/A	Natural	Adult	Longline	10
Peamouth	N/A	Natural	Juvenile	Electrofishing, Backpack	10
Perch, Yellow	N/A	Natural	Adult	Electrofishing, Backpack	10
Perch, Yellow	N/A	Natural	Adult	Hook and line/angler/rod and reel	20
Perch, Yellow	N/A	Natural	Adult	Longline	20
Perch, Yellow	N/A	Natural	Juvenile	Electrofishing, Backpack	25
Perch, Yellow	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	15
Perch, Yellow	N/A	Natural	Juvenile	Longline	20
Pikeminnow, Northern	N/A	Natural	Adult	Hook and line/angler/rod and reel	15
Pikeminnow, Northern	N/A	Natural	Adult	Longline	25
Pikeminnow, Northern	N/A	Natural	Juvenile	Electrofishing, Backpack	25
Pikeminnow, Northern	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	10
Pikeminnow, Northern	N/A	Natural	Juvenile	Longline	20

Species	Listing Unit	Production	Life Stage	Capture Method	Authorized Take
Salmon, Chinook	Lower Columbia River Chinook Salmon ESU (NMFS Threatened)	Natural	Adult	Hook and line/angler/rod and reel	1
Salmon, Chinook	Lower Columbia River Chinook Salmon ESU (NMFS Threatened)	Natural	Juvenile	Electrofishing, Backpack	2
Salmon, Chinook	Lower Columbia River Chinook Salmon ESU (NMFS Threatened)	Natural	Juvenile	Hook and line/angler/rod and reel	2
Salmon, Chinook	Lower Columbia River Chinook Salmon ESU (NMFS Threatened)	Natural	Juvenile	Longline	1
Salmon, Chinook	Upper Willamette River Chinook Salmon ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Electrofishing, Backpack	2
Salmon, Chinook	Upper Willamette River Chinook Salmon ESU (NMFS Threatened)	Natural	Juvenile	Electrofishing, Backpack	1
Salmon, Chinook	Upper Willamette River Chinook Salmon ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Hook and line/angler/rod and reel	3
Salmon, Chinook	Upper Willamette River Chinook Salmon ESU (NMFS Threatened)	Natural	Juvenile	Hook and line/angler/rod and reel	1
Salmon, Chinook	Upper Willamette River Chinook Salmon ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Longline	1
Salmon, Chinook	Upper Willamette River Chinook Salmon ESU (NMFS Threatened)	Natural	Juvenile	Longline	1
Salmon, Coho	Lower Columbia River Coho Salmon ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Electrofishing, Backpack	2
Salmon, Coho	Lower Columbia River Coho Salmon ESU (NMFS Threatened)	Natural	Juvenile	Electrofishing, Backpack	1
Salmon, Coho	Lower Columbia River Coho Salmon ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Hook and line/angler/rod and reel	1
Salmon, Coho	Lower Columbia River Coho Salmon ESU (NMFS Threatened)	Natural	Juvenile	Hook and line/angler/rod and reel	1
Salmon, Coho	Lower Columbia River Coho Salmon ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Longline	1
Salmon, Coho	Lower Columbia River Coho Salmon ESU (NMFS Threatened)	Natural	Juvenile	Longline	1

Species	Listing Unit	Production	Life Stage	Capture Method	Authorized Take
	ESU (NMFS Threatened)				
Sandroller	N/A	Natural	Juvenile	Electrofishing, Backpack	10
Sculpin, Prickly	N/A	Natural	Juvenile	Electrofishing, Backpack	200
Sculpin, Prickly	N/A	Natural	Juvenile	Longline	75
Sculpin, Reticulate	N/A	Natural	Adult	Electrofishing, Backpack	15
Sculpin, Reticulate	N/A	Natural	Adult	Longline	25
Sculpin, Reticulate	N/A	Natural	Juvenile	Electrofishing, Backpack	20
Sculpin, Reticulate	N/A	Natural	Juvenile	Longline	15
Shad, American	N/A	Natural	Juvenile	Electrofishing, Backpack	200
Shiner, Redside	N/A	Natural	Adult	Electrofishing, Backpack	30
Shiner, Redside	N/A	Natural	Adult	Longline	20
Shiner, Redside	N/A	Natural	Juvenile	Electrofishing, Backpack	50
Steelhead	Lower Columbia River Steelhead ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Electrofishing, Backpack	2
Steelhead	Lower Columbia River Steelhead ESU (NMFS Threatened)	Natural	Juvenile	Electrofishing, Backpack	1
Steelhead	Lower Columbia River Steelhead ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Hook and line/angler/rod and reel	2
Steelhead	Lower Columbia River Steelhead ESU (NMFS Threatened)	Natural	Juvenile	Hook and line/angler/rod and reel	1
Steelhead	Lower Columbia River Steelhead ESU (NMFS Threatened)	Natural	Juvenile	Longline	1
Steelhead	N/A	Natural	Adult	Hook and line/angler/rod and reel	1
Steelhead	N/A	Natural	Juvenile	Electrofishing, Backpack	3
Steelhead	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	5
Steelhead	N/A	Natural	Juvenile	Longline	1
Steelhead	Upper Willamette River Steelhead ESU (NMFS Threatened)	Natural	Juvenile	Hook and line/angler/rod and reel	1
Stickleback, Threespine	N/A	Natural	Adult	Electrofishing, Backpack	25
Stickleback, Threespine	N/A	Natural	Juvenile	Electrofishing, Backpack	150
Sucker, Largescale	N/A	Natural	Adult	Hook and line/angler/rod and reel	10

Species	Listing Unit	Production	Life Stage	Capture Method	Authorized Take
Sucker, Largescale	N/A	Natural	Adult	Longline	20
Sucker, Largescale	N/A	Natural	Juvenile	Electrofishing, Backpack	50
Walleye	N/A	Natural	Adult	Hook and line/angler/rod and reel	2
Walleye	N/A	Natural	Adult	Longline	5
Walleye	N/A	Natural	Juvenile	Electrofishing, Backpack	5
Walleye	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	2
Walleye	N/A	Natural	Juvenile	Longline	5
Whitefish, Mountain	N/A	Natural	Adult	Hook and line/angler/rod and reel	3
Whitefish, Mountain	N/A	Natural	Adult	Longline	10
Whitefish, Mountain	N/A	Natural	Juvenile	Electrofishing, Backpack	15
Whitefish, Mountain	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	3

Terms and Conditions for 4(d) Authorized Take

1. Each Researcher must ensure that the listed species are taken only at the levels, by the means, in the areas, and for the purposes set forth in the Programs and in conditions in this letter.
2. Each Researcher must not intentionally kill or cause to be killed any listed species—unless their particular project in the Program approved under the 4(d) rules specifically includes intentional lethal take.
3. Each Researcher must handle listed fish with extreme care and keep them in cold water to the maximum extent possible during sampling and processing procedures. When fish are transferred or held, a healthy environment must be provided—e.g., the holding units must contain adequate amounts of well-circulated water. When gear is used that captures a mix of species, listed fish must be processed first to minimize handling stress.
4. Each Researcher must stop handling listed fish if the water temperature exceeds 70 degrees Fahrenheit at the capture site. Under these conditions, listed fish may only be identified and counted.
5. If the Researcher must anesthetize listed fish to keep from injuring or killing them while they are handled, the fish must be allowed to recover before being released. Fish that are only counted must remain in water and not be anesthetized.
6. Each Researcher must use a sterilized needle for each individual injection when passive integrated transponder tags (PIT-tags) are inserted into listed fish.
7. If the Researcher incidentally captures any listed adult fish while sampling for juveniles, the adult fish must be released without further handling and such take must be reported.
8. Each Researcher must exercise due caution during spawning ground surveys to avoid disturbing listed adult salmonids when they are spawning. Researchers must also avoid walking in salmon streams whenever possible—especially where listed salmonids are likely to spawn. Visual observation must be used instead of intrusive sampling methods, especially when just determining anadromous fish presence.
9. Any Researcher using backpack electrofishing equipment must comply with NMFS' Backpack Electrofishing Guidelines (June 2000) available online at <http://www.nwr.noaa.gov/ESA-Salmon-Regulations-Permits/4d-Rules/upload/electro2000.pdf>. No boat electrofishing is approved under the 4(d) rules.
10. If any Researcher violates the stated terms and conditions they will be subject to any and all penalties provided by the ESA. NMFS may revoke this approval if the Projects it authorizes are not conducted in accordance with the approval, the 4(d) rule, and the requirements of the ESA or if NMFS determines that the findings made under section 4(d) of the ESA are no longer valid.
11. NMFS Northwest Region may amend the provisions of this approval after giving the Researcher reasonable notice of the amendment.
12. Each Researcher must possess a copy of NMFS' determination letter, these terms and conditions, and their project description (copy of submitted application) when engaging in their project activities.
13. The Researcher may not transfer or assign this approval to any other person as defined in Section 3(12) of the ESA. This approval ceases to be in effect if transferred or assigned to any other person without proper authorization from NMFS.
14. Each Researcher must obtain all other Federal, state, and local permits/authorizations necessary for conducting the approved projects.
15. Each Researcher must allow any NMFS employee or representative to accompany field personnel while they conduct the activities authorized. The Researchers must also allow such NMFS representatives to inspect any records or facilities relevant to the activities covered by the approval.

16. Each Researcher must obtain approval from NMFS before changing sampling locations or research protocols.

17. Each Researcher must notify NMFS as soon as possible but no later than two days after any authorized level of take is exceeded or if such an event is likely. Researchers must submit a written report detailing why the authorized take level was exceeded or is likely to be exceeded.

18. On or before January 31 of 2008, ODFW must submit to NMFS an annual report of projects conducted under their Program. The report must be submitted on line using the NMFS' fish research website. In addition, ODFW must provide a description of the populations sampled and an estimate of the proportion of each population taken as a result of their Program including efforts being made to prevent the over utilization of small populations. Approval for subsequent years' research activities will be contingent upon NMFS' acceptance of this report. Falsifying annual reports or records related to the research is a violation of this approval.

19. Each Researcher is responsible for any biological samples collected from listed species as long as they are used for research purposes. The Researcher may not transfer biological samples to anyone not listed in their application without prior written approval from NMFS.

Project-Specific Terms and Conditions

1. Listed species under the jurisdiction of the U.S. Fish & Wildlife Service (USFWS)

Researchers are required to contact the USFWS regarding listed bull trout and other species under their jurisdiction that may be taken during this research. ODFW staff are authorized through ODFW's Cooperative Agreement under ESA Section 6(c)(1).

2. Surrogate Hatchery Fish: Hatchery fish shall be used as test animals whenever possible as surrogates for listed fish. In particular, projects associated with documenting the effects of hydropower facilities on fish survival and/or passage shall explore using hatchery fish as test animals and the project leaders must notify NMFS of their plans.

OREGON FISH BIOLOGISTS CONTACT DETAILS

ODFW Biologist	Phone	E-mail	Watershed District	Office
Todd Alsbury	(971) 673-6011	Todd.Alsbury@state.or.us	North Willamette- East District	Clackamas
Tim Bailey	(541) 962-1829	Timothy.D.Bailey@state.or.us	Grande Ronde	LaGrande
Ron Boyce	(971) 673-6081	Raymond.R.Boyce@state.or.us	Mainstem Columbia	Clackamas
Keith Braun	(503) 842-2741	Keith.E.Braun@state.or.us	North Coast	Tillamook
Bob Buckman	(541) 867-4741 ext. 224	Robert.C.Buckman@state.or.us	Mid Coast	Newport
Todd Confer	(541) 247-7605	Todd.A.Confer@state.or.us	Rogue	Gold Beach
Bill Duke	(541) 276-2344	william.b.duke@state.or.us	Umatilla	Pendleton
Rod French	(541) 296-4628	Rod.A.French@state.or.us	Mid Columbia	The Dalles
Mike Gray	(541) 888-5515	Michael.E.Gray@state.or.us	Coos-Coquille	Charleston
Steve Mamoyac	(541) 757-4186 ext. 249	Steven.R.Mamoyac@state.or.us	South Willamette	Corvallis
Arlene Merems	(541) 867-0300 ext. 246	Arlene.R.Merems@state.or.us	Marine Zone	Newport
Tom Murtagh	(503) 621-3488	Tom.Murtagh@state.or.us	North Willamette- West District	Clackamas
Shannon Osbon	541-947-2950	Shannon.M.Osbon@state.or.us	Lake Basin	Lakeview
Ray Perkins	(541) 889-6975 ext. 25	Raymond.A.Perkins@state.or.us	Malheur	Ontario
Brad Smith	(541) 426-3279	Brad.Smith@state.or.us	Grande Ronde	Enterprise
Roger Smith	(541) 883-5732	Roger.C.Smith@state.or.us	Klamath	Klamath Falls
Tim Unterwegner	(541) 575-1167 ext. 225	Tim.Unterwegner@state.or.us	John Day	John Day
Vacant	(541) 388-6363		Deschutes	Bend
Vacant	(541) 440-3353		Umpqua	Roseburg
Dan Van Dyke	(541) 826-8774 ext. 234	Daniel.J.VanDyke@state.or.us	Rogue	Central Point
Tim Walters	(541) 573-6582	Timothy.R.Walters@state.or.us	Malheur	Hines
Jeff Ziller	(541) 726-3515 ext. 26	Jeffrey.S.Ziller@state.or.us	South Willamette	Springfield



Oregon

Theodore R. Kulongoski, Governor

Department of Fish and Wildlife

Fish Division

3406 Cherry Avenue NE

Salem, OR 97303

(503) 947-6201

FAX (503) 947-6202

TTY (503) 947-6339

www.dfw.state.or.us

SCIENTIFIC TAKING PERMIT - FISH



PERMITTEE: **Laurel Brown**
ORGANIZATION: **Ellis Ecological Services, Inc.**

PERMIT NUMBER: **OR2007-4082 partial**
PROJECT TITLE: **Round 3B fish and shellfish sampling for the RI/FS Portland Harbor Superfund Site.**

ADDRESS: **20988 S. Springwater Rd.
Estacada, OR 97023**

DATES: **8/9/2007 through 12/31/2007**

PHONE: **503-631-7809**

E-MAIL: **laurel.brown1@gmail.com**

FEDERAL AUTHORIZATION: **NMFS 4d authorization letter dated 5/23/2007, expires 12/31/2007**

NAME OF PROJECT LEADER:
Robert H. Ellis, Ph.D.

NAME OF COLLECTOR:
Laurel Brown, David DeKrey, Thai Do, Douglas Dysart, Robert H. Ellis, Ph.D., Kim Gould, Peter Kaczynski, Lisa Marco, Steve Novotny, Angelita Rodriguez, Beluse Schonek, Ian Stupakoff, Stefan Wodzicki, Jenifer Schmitz, Brian Pointer, Joss Moore, Jane Sund, Jane Sexton, Jonathan Reeve, Matt Luxon, Joanna Florer

SIGNATURE: _____ SIGNATURE: _____

TYPE OF PERMIT: **Individual**

RENEWABLE: **YES** MAY COPY? **YES**

LOCATION WHERE COLLECTION ACTIVITY IS AUTHORIZED:

Lower Willamette (Scappoose) HUC: Lower Willamette River - Sampling efforts will occur at EPA designated sites within the lower Willamette River from RM 0.5 to RM 12.0.

CONDITIONS AND AUTHORIZATION OF THIS PERMIT:

1. General conditions of Oregon Revised Statutes and Oregon Administrative Rules apply to this permit that cannot be used in lieu of any permit required by federal law or regulation. Permission to sample in areas where federally protected fish may occur is contingent upon the permittee obtaining necessary authorization from the appropriate federal agency and acting in accordance with the conditions established by the federal government.
2. This permit is not transferable from one company or person to another and must be carried on person while collecting.
3. Access to private property is contingent on the permission of the landowner. This permit does not authorize trespassing.
4. This permit is not valid in any refuge, park, city, wildlife area, or area closed to collection without written approval of manager or administrator.
5. Local officials of the Department of Fish and Wildlife and Oregon State Police must be notified prior to each sampling effort.

6. An annual activity/collection report associated with this permit must be submitted to ODFW by 31 December 2007, using the on line application process available at <http://fishresearch.nwr.noaa.gov/>. Renewal of this permit is subject to receipt by ODFW of the annual activity/collection report either prior to or in conjunction with the renewal application.
7. No protected species may be taken unless specifically listed below and any other necessary federal authorizations have been granted. See ODFW Sport Fishing Regulations for listing of species, or contact ODFW directly.
8. All numbers of fish authorized in this permit are annual totals.
9. Persons named above as "Collectors" must sign their own copy of the permit and carry the signed copy while engaged in the activities authorized in this permit.
10. Persons not named above may assist in collecting only while accompanied by project leader(s) or authorized collector(s) listed above.
11. Additional conditions and authorization:
 - a) May collect and sacrifice (take) up to 35 smallmouth bass, 3 common carp, and 374 prickly sculpin. Fish should be euthanized quickly (i.e. using a lethal dose of anesthetic).
 - b) May capture, examine, and release (take) fish as described in Table 1. Upon recovery, all fish should be released as soon as possible at or near the site of capture unless otherwise directed by the ODFW biologist. All fish handled must be reported in the annual report for this project.
 - c) Fish may be taken by backpack electrofishing, longline/setline, and hook and line/angling. Electrofishing protocols should follow the guidelines established by the National Marine Fisheries Service (NMFS) in June 2000. Members of the Oregon Bass and Panfish Club may assist collectors named on page 1 but may not collect fish for this project on their own.
 - d) Baited setlines should be used with caution. Set time should be restricted to no longer than 2 hours. After 8 hours of collection (4 2-hour sets), review catch with ODFW biologists before proceeding (971-673-6011 or 971-673-6013).
 - e) Activities must be coordinated with local ODFW Fish Biologist, Todd Alsbury, *prior to any sampling*.
 - f) Indirect mortality may not exceed 5% (electrofishing) or 1% (other methods) of the total take for any species at any site. In the event that mortality for any species exceeds this rate, the permittee should contact the Endangered Species Act Program Specialist, ODFW, (503/947-6254) prior to any further activity.
 - g) Follow FDA approved protocols and use only FDA approved substances for anesthetizing fish.
 - h) If sampling in multiple sub-basins (4th field HUCs), boots and sampling equipment intended for use in the water will be disinfected and air-dried prior to use in each location. Water containing chemicals used in handling fish and used for disinfecting equipment must not be allowed to enter waters of the state. Dispose of on dry land or allow to evaporate.
 - i) This permit only grants authority to conduct this activity under state law. Obtaining appropriate federal clearance under the Endangered Species Act is the permittee's responsibility. Terms and conditions in Attachment 1 must be adhered to for species covered under NMFS 4(d) authorization. If a condition on this permit conflicts with a condition on the federal permit or authorization, then the permittee must comply with the more restrictive condition.
 - j) Unless otherwise stated in this permit, all authorized take is only for the species, purposes and by the protocols described in the permit application. If you approach or meet your permitted take at a location and still have sampling to do, please contact the ODFW ESA Coordinator as soon as possible.

ISSUED BY:



DATE: August 17, 2007

Shelly A. Miller
Endangered Species Act Program Specialist

Distribution: G. Rule, L. Schaeffer- NOAA-Fisheries, T. Alsbury, D. Ehlers - ODFW

Table 1: Species and numbers that may be capture, handled, and released (taken)

Species	Listing Unit	Production	Life Stage	Capture Method	Authorized Take
Bass, Largemouth	N/A	Natural	Adult	Electrofishing, Backpack	2
Bass, Largemouth	N/A	Natural	Adult	Hook and line/angler/rod and reel	30
Bass, Largemouth	N/A	Natural	Adult	Longline	15
Bass, Largemouth	N/A	Natural	Juvenile	Electrofishing, Backpack	25
Bass, Largemouth	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	20
Bass, Largemouth	N/A	Natural	Juvenile	Longline	20
Bass, Smallmouth	N/A	Natural	Adult	Electrofishing, Backpack	3
Bass, Smallmouth	N/A	Natural	Adult	Hook and line/angler/rod and reel	70
Bass, Smallmouth	N/A	Natural	Adult	Longline	3
Bass, Smallmouth	N/A	Natural	Juvenile	Electrofishing, Backpack	250
Bass, Smallmouth	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	560
Bass, Smallmouth	N/A	Natural	Juvenile	Longline	15
Bluegill	N/A	Natural	Adult	Electrofishing, Backpack	20
Bluegill	N/A	Natural	Adult	Hook and line/angler/rod and reel	25
Bluegill	N/A	Natural	Adult	Longline	35
Bluegill	N/A	Natural	Juvenile	Electrofishing, Backpack	50
Bluegill	N/A	Natural	Juvenile	Longline	25
Bullhead, Brown	N/A	Natural	Adult	Electrofishing, Backpack	5
Bullhead, Brown	N/A	Natural	Adult	Hook and line/angler/rod and reel	10
Bullhead, Brown	N/A	Natural	Adult	Longline	20
Bullhead, Brown	N/A	Natural	Juvenile	Electrofishing, Backpack	10
Bullhead, Brown	N/A	Natural	Juvenile	Longline	15
Carp, Common	N/A	Natural	Adult	Hook and line/angler/rod and reel	5
Carp, Common	N/A	Natural	Adult	Longline	2
Carp, Common	N/A	Natural	Juvenile	Electrofishing, Backpack	20
Carp, Common	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	5
Carp, Common	N/A	Natural	Juvenile	Longline	10
Chub, Chiselmouth	N/A	Natural	Adult	Electrofishing, Backpack	5
Chub, Chiselmouth	N/A	Natural	Adult	Longline	10

Species	Listing Unit	Production	Life Stage	Capture Method	Authorized Take
Chub, Chiselmouth	N/A	Natural	Juvenile	Electrofishing, Backpack	10
Chub, Chiselmouth	N/A	Natural	Juvenile	Longline	5
Crappie, Black	N/A	Natural	Adult	Electrofishing, Backpack	20
Crappie, Black	N/A	Natural	Adult	Hook and line/angler/rod and reel	15
Crappie, Black	N/A	Natural	Adult	Longline	20
Crappie, Black	N/A	Natural	Juvenile	Electrofishing, Backpack	50
Crappie, Black	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	20
Crappie, Black	N/A	Natural	Juvenile	Longline	20
Crappie, White	N/A	Natural	Adult	Hook and line/angler/rod and reel	10
Crappie, White	N/A	Natural	Adult	Longline	10
Crappie, White	N/A	Natural	Juvenile	Electrofishing, Backpack	20
Crappie, White	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	5
Crappie, White	N/A	Natural	Juvenile	Longline	10
Kilifish, Banded	N/A	Natural	Adult	Electrofishing, Backpack	30
Kilifish, Banded	N/A	Natural	Juvenile	Electrofishing, Backpack	50
Lamprey, Pacific	N/A	Natural	Juvenile	Electrofishing, Backpack	4
Peamouth	N/A	Natural	Adult	Electrofishing, Backpack	5
Peamouth	N/A	Natural	Adult	Longline	10
Peamouth	N/A	Natural	Juvenile	Electrofishing, Backpack	10
Perch, Yellow	N/A	Natural	Adult	Electrofishing, Backpack	10
Perch, Yellow	N/A	Natural	Adult	Hook and line/angler/rod and reel	20
Perch, Yellow	N/A	Natural	Adult	Longline	20
Perch, Yellow	N/A	Natural	Juvenile	Electrofishing, Backpack	25
Perch, Yellow	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	15
Perch, Yellow	N/A	Natural	Juvenile	Longline	20
Pikeminnow, Northern	N/A	Natural	Adult	Hook and line/angler/rod and reel	15
Pikeminnow, Northern	N/A	Natural	Adult	Longline	25
Pikeminnow, Northern	N/A	Natural	Juvenile	Electrofishing, Backpack	25
Pikeminnow, Northern	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	10
Pikeminnow, Northern	N/A	Natural	Juvenile	Longline	20

Species	Listing Unit	Production	Life Stage	Capture Method	Authorized Take
Salmon, Chinook	Lower Columbia River Chinook Salmon ESU (NMFS Threatened)	Natural	Adult	Hook and line/angler/rod and reel	1
Salmon, Chinook	Lower Columbia River Chinook Salmon ESU (NMFS Threatened)	Natural	Juvenile	Electrofishing, Backpack	2
Salmon, Chinook	Lower Columbia River Chinook Salmon ESU (NMFS Threatened)	Natural	Juvenile	Hook and line/angler/rod and reel	2
Salmon, Chinook	Lower Columbia River Chinook Salmon ESU (NMFS Threatened)	Natural	Juvenile	Longline	1
Salmon, Chinook	Upper Willamette River Chinook Salmon ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Electrofishing, Backpack	2
Salmon, Chinook	Upper Willamette River Chinook Salmon ESU (NMFS Threatened)	Natural	Juvenile	Electrofishing, Backpack	1
Salmon, Chinook	Upper Willamette River Chinook Salmon ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Hook and line/angler/rod and reel	3
Salmon, Chinook	Upper Willamette River Chinook Salmon ESU (NMFS Threatened)	Natural	Juvenile	Hook and line/angler/rod and reel	1
Salmon, Chinook	Upper Willamette River Chinook Salmon ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Longline	1
Salmon, Chinook	Upper Willamette River Chinook Salmon ESU (NMFS Threatened)	Natural	Juvenile	Longline	1
Salmon, Coho	Lower Columbia River Coho Salmon ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Electrofishing, Backpack	2
Salmon, Coho	Lower Columbia River Coho Salmon ESU (NMFS Threatened)	Natural	Juvenile	Electrofishing, Backpack	1
Salmon, Coho	Lower Columbia River Coho Salmon ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Hook and line/angler/rod and reel	1
Salmon, Coho	Lower Columbia River Coho Salmon ESU (NMFS Threatened)	Natural	Juvenile	Hook and line/angler/rod and reel	1
Salmon, Coho	Lower Columbia River Coho Salmon ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Longline	1
Salmon, Coho	Lower Columbia River Coho Salmon ESU (NMFS Threatened)	Natural	Juvenile	Longline	1

Species	Listing Unit	Production	Life Stage	Capture Method	Authorized Take
	ESU (NMFS Threatened)				
Sandroller	N/A	Natural	Juvenile	Electrofishing, Backpack	10
Sculpin, Prickly	N/A	Natural	Juvenile	Electrofishing, Backpack	200
Sculpin, Prickly	N/A	Natural	Juvenile	Longline	75
Sculpin, Reticulate	N/A	Natural	Adult	Electrofishing, Backpack	15
Sculpin, Reticulate	N/A	Natural	Adult	Longline	25
Sculpin, Reticulate	N/A	Natural	Juvenile	Electrofishing, Backpack	20
Sculpin, Reticulate	N/A	Natural	Juvenile	Longline	15
Shad, American	N/A	Natural	Juvenile	Electrofishing, Backpack	200
Shiner, Redside	N/A	Natural	Adult	Electrofishing, Backpack	30
Shiner, Redside	N/A	Natural	Adult	Longline	20
Shiner, Redside	N/A	Natural	Juvenile	Electrofishing, Backpack	50
Steelhead	Lower Columbia River Steelhead ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Electrofishing, Backpack	2
Steelhead	Lower Columbia River Steelhead ESU (NMFS Threatened)	Natural	Juvenile	Electrofishing, Backpack	1
Steelhead	Lower Columbia River Steelhead ESU (NMFS Threatened)	Listed Hatchery Adipose Clip	Juvenile	Hook and line/angler/rod and reel	2
Steelhead	Lower Columbia River Steelhead ESU (NMFS Threatened)	Natural	Juvenile	Hook and line/angler/rod and reel	1
Steelhead	Lower Columbia River Steelhead ESU (NMFS Threatened)	Natural	Juvenile	Longline	1
Steelhead	N/A	Natural	Adult	Hook and line/angler/rod and reel	1
Steelhead	N/A	Natural	Juvenile	Electrofishing, Backpack	3
Steelhead	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	5
Steelhead	N/A	Natural	Juvenile	Longline	1
Steelhead	Upper Willamette River Steelhead ESU (NMFS Threatened)	Natural	Juvenile	Hook and line/angler/rod and reel	1
Stickleback, Threespine	N/A	Natural	Adult	Electrofishing, Backpack	25
Stickleback, Threespine	N/A	Natural	Juvenile	Electrofishing, Backpack	150
Sucker, Largescale	N/A	Natural	Adult	Hook and line/angler/rod and reel	10

Species	Listing Unit	Production	Life Stage	Capture Method	Authorized Take
Sucker, Largescale	N/A	Natural	Adult	Longline	20
Sucker, Largescale	N/A	Natural	Juvenile	Electrofishing, Backpack	50
Walleye	N/A	Natural	Adult	Hook and line/angler/rod and reel	2
Walleye	N/A	Natural	Adult	Longline	5
Walleye	N/A	Natural	Juvenile	Electrofishing, Backpack	5
Walleye	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	2
Walleye	N/A	Natural	Juvenile	Longline	5
Whitefish, Mountain	N/A	Natural	Adult	Hook and line/angler/rod and reel	3
Whitefish, Mountain	N/A	Natural	Adult	Longline	10
Whitefish, Mountain	N/A	Natural	Juvenile	Electrofishing, Backpack	15
Whitefish, Mountain	N/A	Natural	Juvenile	Hook and line/angler/rod and reel	3

Terms and Conditions for 4(d) Authorized Take

1. Each Researcher must ensure that the listed species are taken only at the levels, by the means, in the areas, and for the purposes set forth in the Programs and in conditions in this letter.
2. Each Researcher must not intentionally kill or cause to be killed any listed species—unless their particular project in the Program approved under the 4(d) rules specifically includes intentional lethal take.
3. Each Researcher must handle listed fish with extreme care and keep them in cold water to the maximum extent possible during sampling and processing procedures. When fish are transferred or held, a healthy environment must be provided—e.g., the holding units must contain adequate amounts of well-circulated water. When gear is used that captures a mix of species, listed fish must be processed first to minimize handling stress.
4. Each Researcher must stop handling listed fish if the water temperature exceeds 70 degrees Fahrenheit at the capture site. Under these conditions, listed fish may only be identified and counted.
5. If the Researcher must anesthetize listed fish to keep from injuring or killing them while they are handled, the fish must be allowed to recover before being released. Fish that are only counted must remain in water and not be anesthetized.
6. Each Researcher must use a sterilized needle for each individual injection when passive integrated transponder tags (PIT-tags) are inserted into listed fish.
7. If the Researcher incidentally captures any listed adult fish while sampling for juveniles, the adult fish must be released without further handling and such take must be reported.
8. Each Researcher must exercise due caution during spawning ground surveys to avoid disturbing listed adult salmonids when they are spawning. Researchers must also avoid walking in salmon streams whenever possible—especially where listed salmonids are likely to spawn. Visual observation must be used instead of intrusive sampling methods, especially when just determining anadromous fish presence.
9. Any Researcher using backpack electrofishing equipment must comply with NMFS' Backpack Electrofishing Guidelines (June 2000) available online at <http://www.nwr.noaa.gov/ESA-Salmon-Regulations-Permits/4d-Rules/upload/electro2000.pdf>. No boat electrofishing is approved under the 4(d) rules.
10. If any Researcher violates the stated terms and conditions they will be subject to any and all penalties provided by the ESA. NMFS may revoke this approval if the Projects it authorizes are not conducted in accordance with the approval, the 4(d) rule, and the requirements of the ESA or if NMFS determines that the findings made under section 4(d) of the ESA are no longer valid.
11. NMFS Northwest Region may amend the provisions of this approval after giving the Researcher reasonable notice of the amendment.
12. Each Researcher must possess a copy of NMFS' determination letter, these terms and conditions, and their project description (copy of submitted application) when engaging in their project activities.
13. The Researcher may not transfer or assign this approval to any other person as defined in Section 3(12) of the ESA. This approval ceases to be in effect if transferred or assigned to any other person without proper authorization from NMFS.
14. Each Researcher must obtain all other Federal, state, and local permits/authorizations necessary for conducting the approved projects.
15. Each Researcher must allow any NMFS employee or representative to accompany field personnel while they conduct the activities authorized. The Researchers must also allow such NMFS representatives to inspect any records or facilities relevant to the activities covered by the approval.

16. Each Researcher must obtain approval from NMFS before changing sampling locations or research protocols.

17. Each Researcher must notify NMFS as soon as possible but no later than two days after any authorized level of take is exceeded or if such an event is likely. Researchers must submit a written report detailing why the authorized take level was exceeded or is likely to be exceeded.

18. On or before January 31 of 2008, ODFW must submit to NMFS an annual report of projects conducted under their Program. The report must be submitted on line using the NMFS' fish research website. In addition, ODFW must provide a description of the populations sampled and an estimate of the proportion of each population taken as a result of their Program including efforts being made to prevent the over utilization of small populations. Approval for subsequent years' research activities will be contingent upon NMFS' acceptance of this report. Falsifying annual reports or records related to the research is a violation of this approval.

19. Each Researcher is responsible for any biological samples collected from listed species as long as they are used for research purposes. The Researcher may not transfer biological samples to anyone not listed in their application without prior written approval from NMFS.

Project-Specific Terms and Conditions

1. Listed species under the jurisdiction of the U.S. Fish & Wildlife Service (USFWS)

Researchers are required to contact the USFWS regarding listed bull trout and other species under their jurisdiction that may be taken during this research. ODFW staff are authorized through ODFW's Cooperative Agreement under ESA Section 6(c)(1).

2. Surrogate Hatchery Fish: Hatchery fish shall be used as test animals whenever possible as surrogates for listed fish. In particular, projects associated with documenting the effects of hydropower facilities on fish survival and/or passage shall explore using hatchery fish as test animals and the project leaders must notify NMFS of their plans.

OREGON FISH BIOLOGISTS CONTACT DETAILS

ODFW Biologist	Phone	E-mail	Watershed District	Office
Todd Alsbury	(971) 673-6011	Todd.Alsbury@state.or.us	North Willamette- East District	Clackamas
Tim Bailey	(541) 962-1829	Timothy.D.Bailey@state.or.us	Grande Ronde	LaGrande
Ron Boyce	(971) 673-6081	Raymond.R.Boyce@state.or.us	Mainstem Columbia	Clackamas
Keith Braun	(503) 842-2741	Keith.E.Braun@state.or.us	North Coast	Tillamook
Bob Buckman	(541) 867-4741 ext. 224	Robert.C.Buckman@state.or.us	Mid Coast	Newport
Todd Confer	(541) 247-7605	Todd.A.Confer@state.or.us	Rogue	Gold Beach
Bill Duke	(541) 276-2344	william.b.duke@state.or.us	Umatilla	Pendleton
Rod French	(541) 296-4628	Rod.A.French@state.or.us	Mid Columbia	The Dalles
Mike Gray	(541) 888-5515	Michael.E.Gray@state.or.us	Coos-Coquille	Charleston
Steve Mamoyac	(541) 757-4186 ext. 249	Steven.R.Mamoyac@state.or.us	South Willamette	Corvallis
Arlene Merems	(541) 867-0300 ext. 246	Arlene.R.Merems@state.or.us	Marine Zone	Newport
Tom Murtagh	(503) 621-3488	Tom.Murtagh@state.or.us	North Willamette- West District	Clackamas
Shannon Osbon	541-947-2950	Shannon.M.Osbon@state.or.us	Lake Basin	Lakeview
Ray Perkins	(541) 889-6975 ext. 25	Raymond.A.Perkins@state.or.us	Malheur	Ontario
Brad Smith	(541) 426-3279	Brad.Smith@state.or.us	Grande Ronde	Enterprise
Roger Smith	(541) 883-5732	Roger.C.Smith@state.or.us	Klamath	Klamath Falls
Tim Unterwegner	(541) 575-1167 ext. 225	Tim.Unterwegner@state.or.us	John Day	John Day
Vacant	(541) 388-6363		Deschutes	Bend
Vacant	(541) 440-3353		Umpqua	Roseburg
Dan Van Dyke	(541) 826-8774 ext. 234	Daniel.J.VanDyke@state.or.us	Rogue	Central Point
Tim Walters	(541) 573-6582	Timothy.R.Walters@state.or.us	Malheur	Hines
Jeff Ziller	(541) 726-3515 ext. 26	Jeffrey.S.Ziller@state.or.us	South Willamette	Springfield